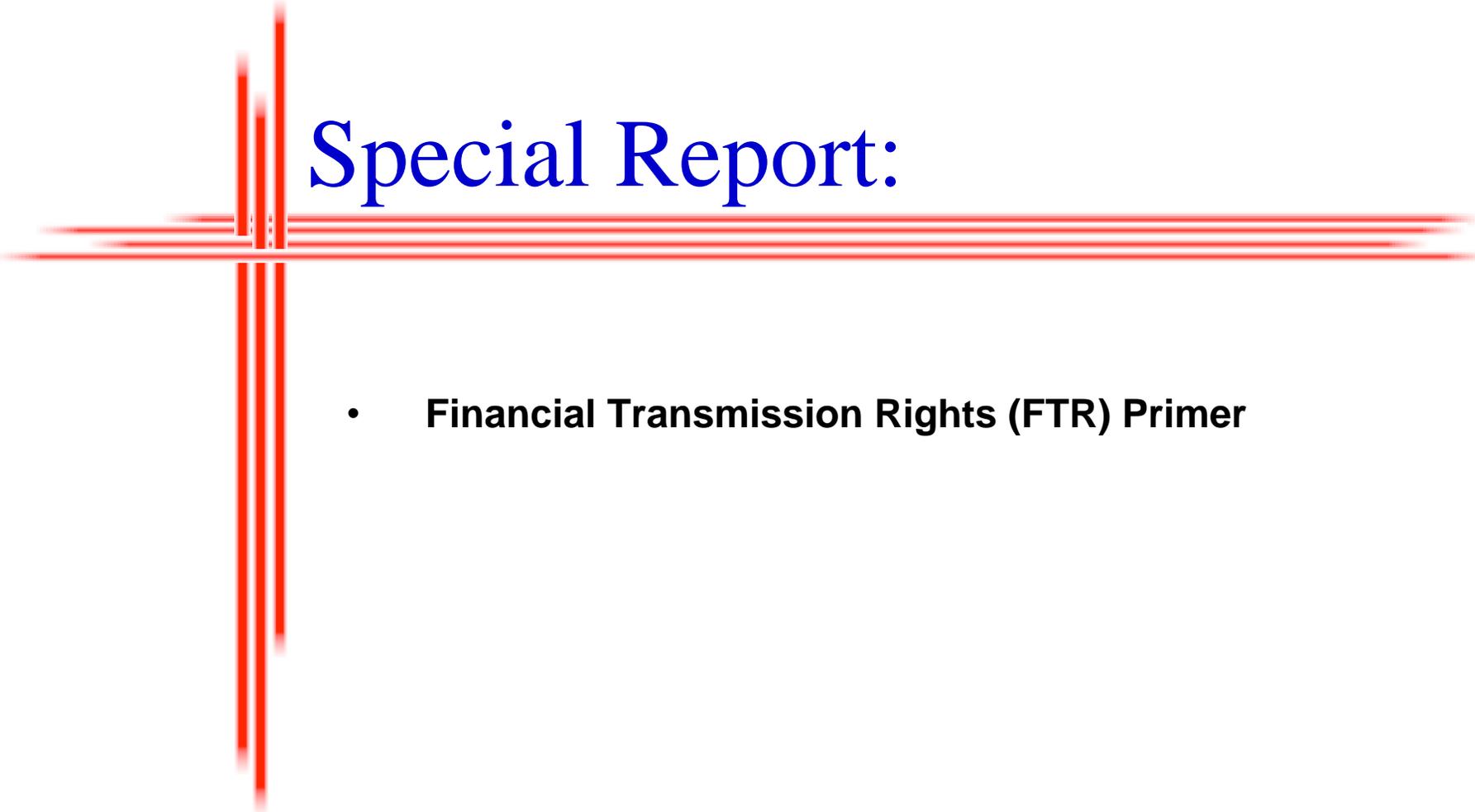


OE ENERGY MARKET SNAPSHOT

Western States Version – January 2009 Data

- **Special Report**
- **Natural Gas and Fuel Markets**
- **Electricity Markets**

Office of Enforcement
Federal Energy Regulatory Commission
February 2009



Special Report:

- **Financial Transmission Rights (FTR) Primer**

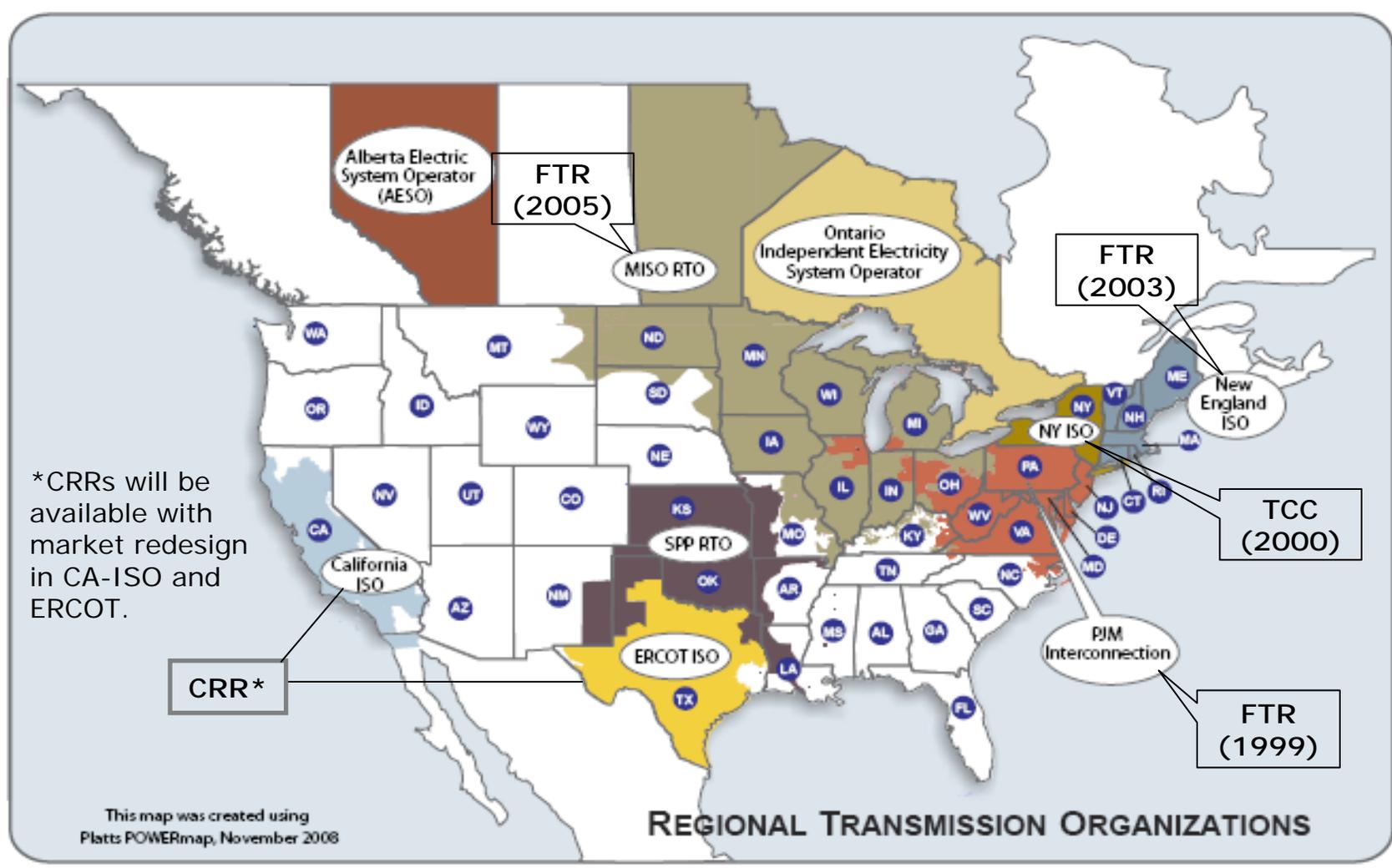
What is an FTR?

- **Financial Transmission Right**
- Important tool for managing congestion risk
 - Settles on congestion price differentials between specific zones and/or nodes
 - A financial right (not a physical right)
 - Applicable to the Day-Ahead market only
- Formally available in RTO markets with Day-Ahead Settlements

What is an ARR?

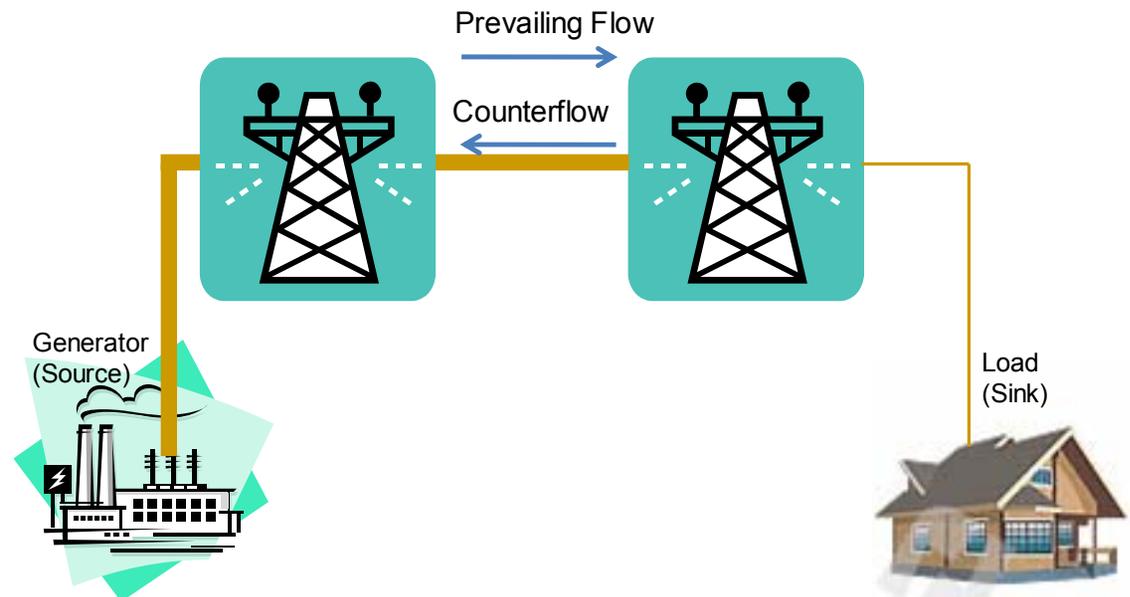
- **Auction Revenue Right**
- Allocations to MPs with firm historical usage of the transmission system, e.g.,
 - ❑ PJM, MISO – NIS or FPPS customers (ARRs)
 - ❑ ISO-NE – Congestion-paying LSEs (ARRs)
 - ❑ CA-ISO – Congestion-paying LSEs (CRRs)
 - ❑ NYISO – Transmission owners (ETCNL/RCRRs)
- Entitlements (not financial instruments)
 - ❑ Can be converted to financial instruments
- Entitles the holder to receive a Right to the Revenue (or Charge) from the FTR Auction
- PJM Annual Auction 2008-9 results: 209 GW (65%) FTR bids and offers, 112 GW (35%) ARR allocation

FTR Auction Market History

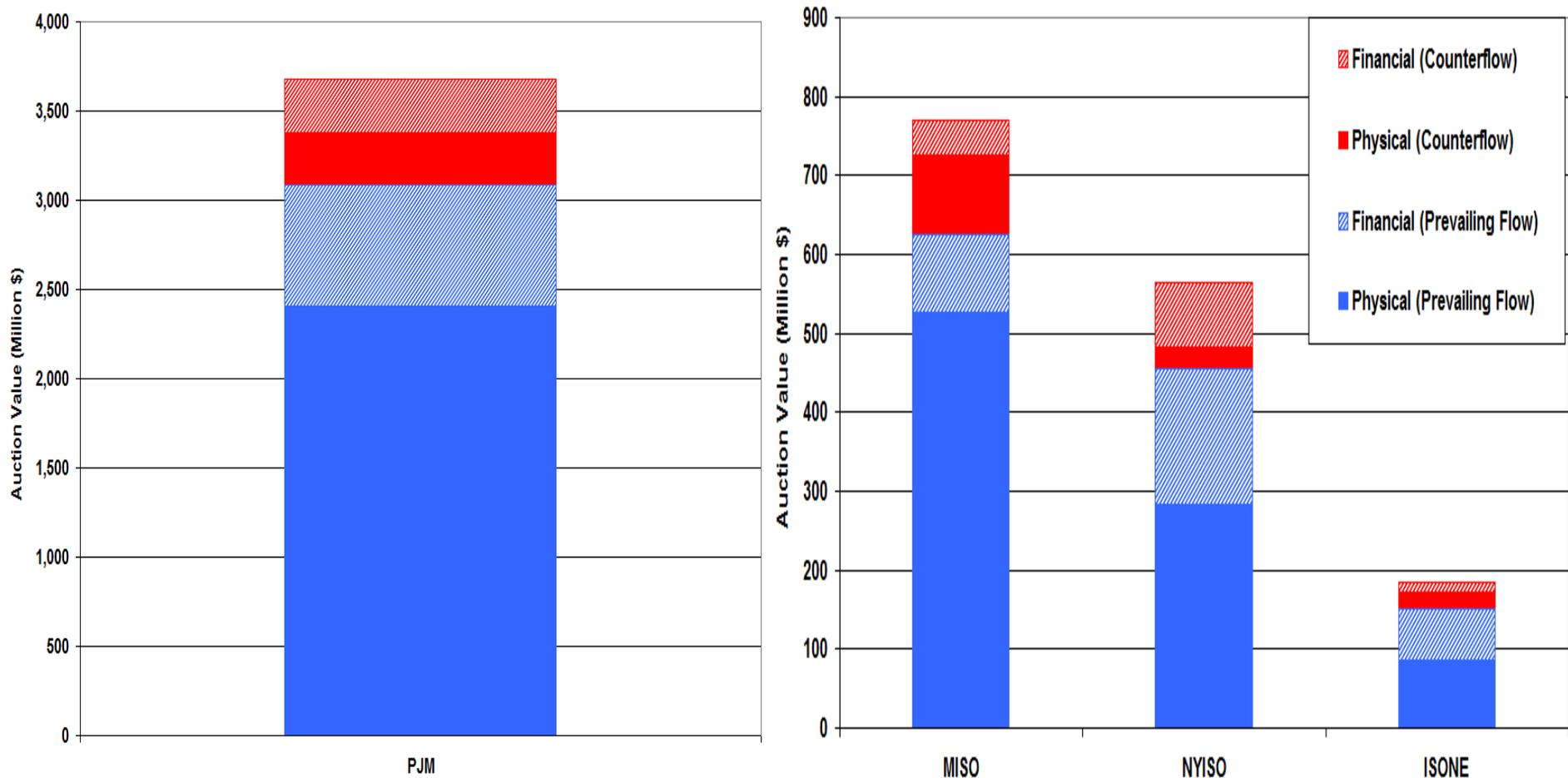


What are Counterflow FTRs?

- Hedge funds are the largest holders of counterflow FTRs.
- A counterflow FTR holder speculates that power will flow from the higher-priced load to the lower-priced generator in the DA market.
 - Counterflow FTR holder is paid in the auction to take congestion risks.
 - Counterflow FTR position is profitable when the amount the holder receives for the auction-clearing price exceeds the DA hourly congestion cost during the FTR term.



FTR Market Size and Participants



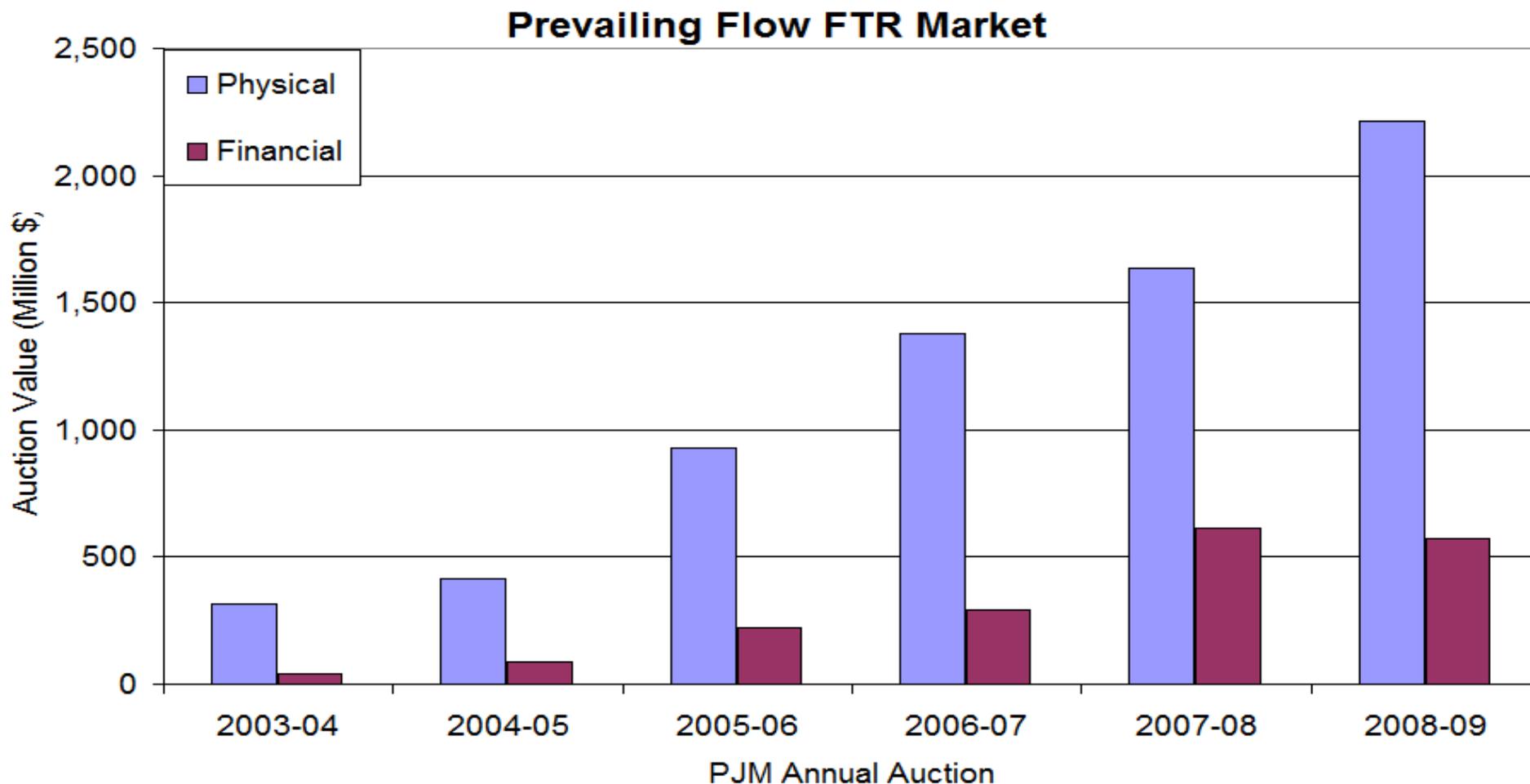
Source: Derived from Ventyx.

(1) Data reflects calendar year 2008 year auctions (long- and -short terms) through December 30.

(2) Categorization of market participants is based on staff's estimates. Physical players include IOUs, IPPs, Municipals and Cooperatives. Financial players include banks and hedge funds.

(3) Counterflow FTR auction values are negative since these are payments to market participants. For the purposes of the graph, these auction values are shown as positive values.

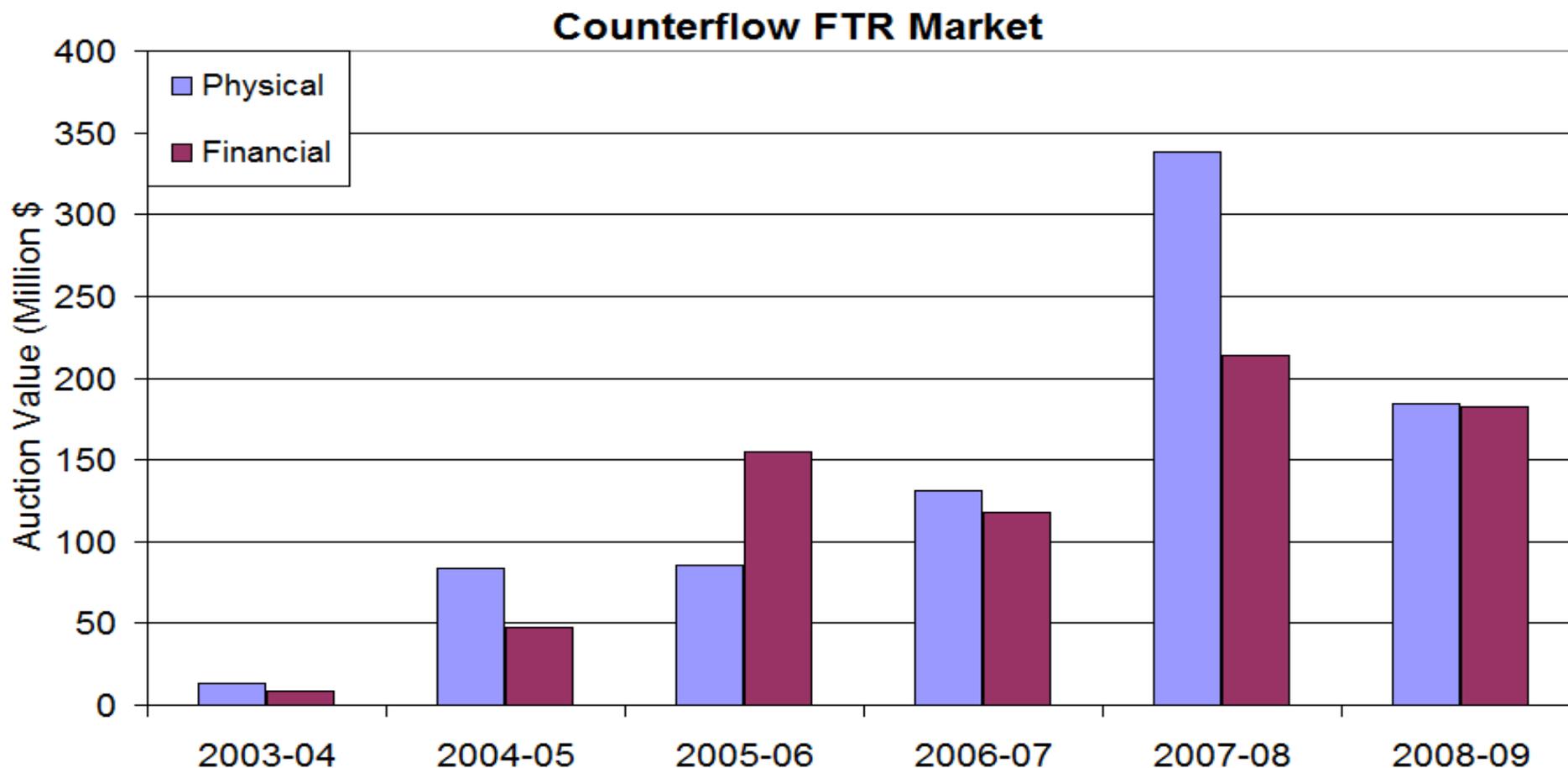
Growth of the FTR Auction Market - The PJM Example



Source: Derived from Ventyx.

(1) Categorization of market participants is based on staff's estimates. Physical players include IOUs, IPPs, Municipals and Cooperatives. Financial players include banks and hedge funds.

Growth of the FTR Auction Market - The PJM Example (...continued)



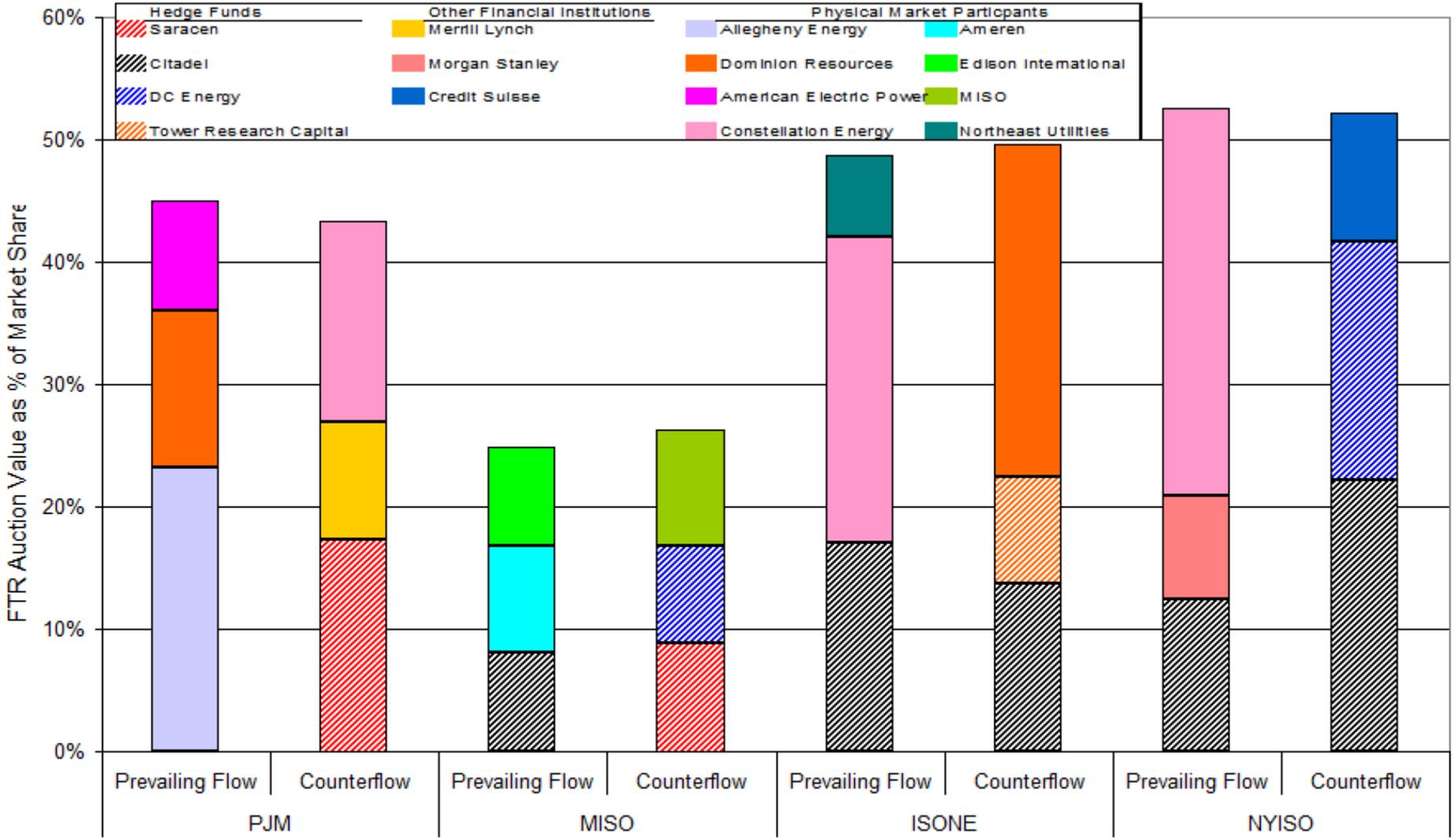
PJM Annual Auction

Source: Derived from Ventyx.

(1) Categorization of market participants is based on staff's estimates. Physical players include IOUs, IPPs, Municipals and Cooperatives. Financial players include banks and hedge funds.

(2) Counterflow FTR auction values are negative since these are payments to market participants. For the purposes of the graph, these auction values are shown as positive values.

Top 3 Market Participants By Market and Flow Type



Source: Derived from Ventyx.

(1) Data reflect calendar year 2008 auctions (long- and -short term).

(2) Market share is calculated as the FTR auction clearing price multiplied by FTR quantities for each market participant relative to the market as a whole for prevailing and counter flow positions.

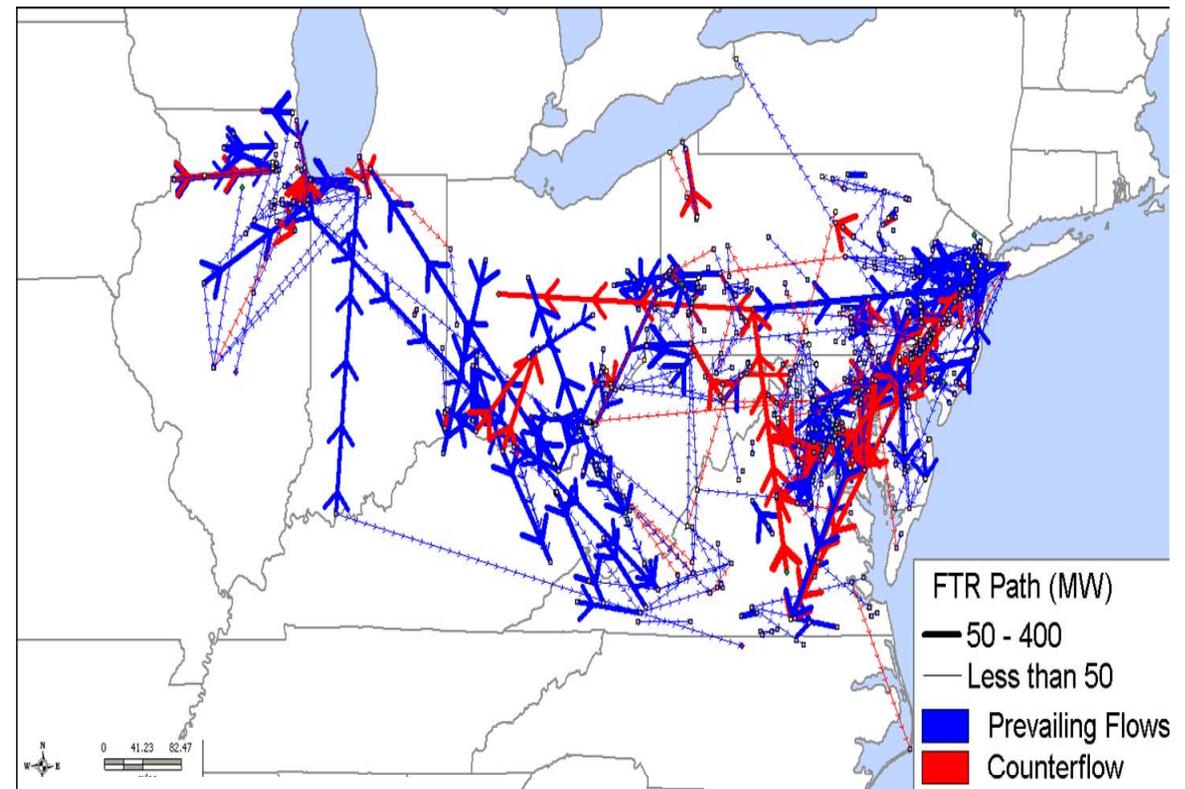
FTR Markets Are Complex

Example of a Financial Participant's Positions in PJM's FTR Market

FTR Positions as of Dec. '08

- 2,300 FTR Positions totaling 78 GW
 - Monthly, Quarterly and Annual terms
 - On-peak and off-peak periods.

As a result, each of the 2,300 FTR paths has a set of unique risk characteristics and pay-outs.

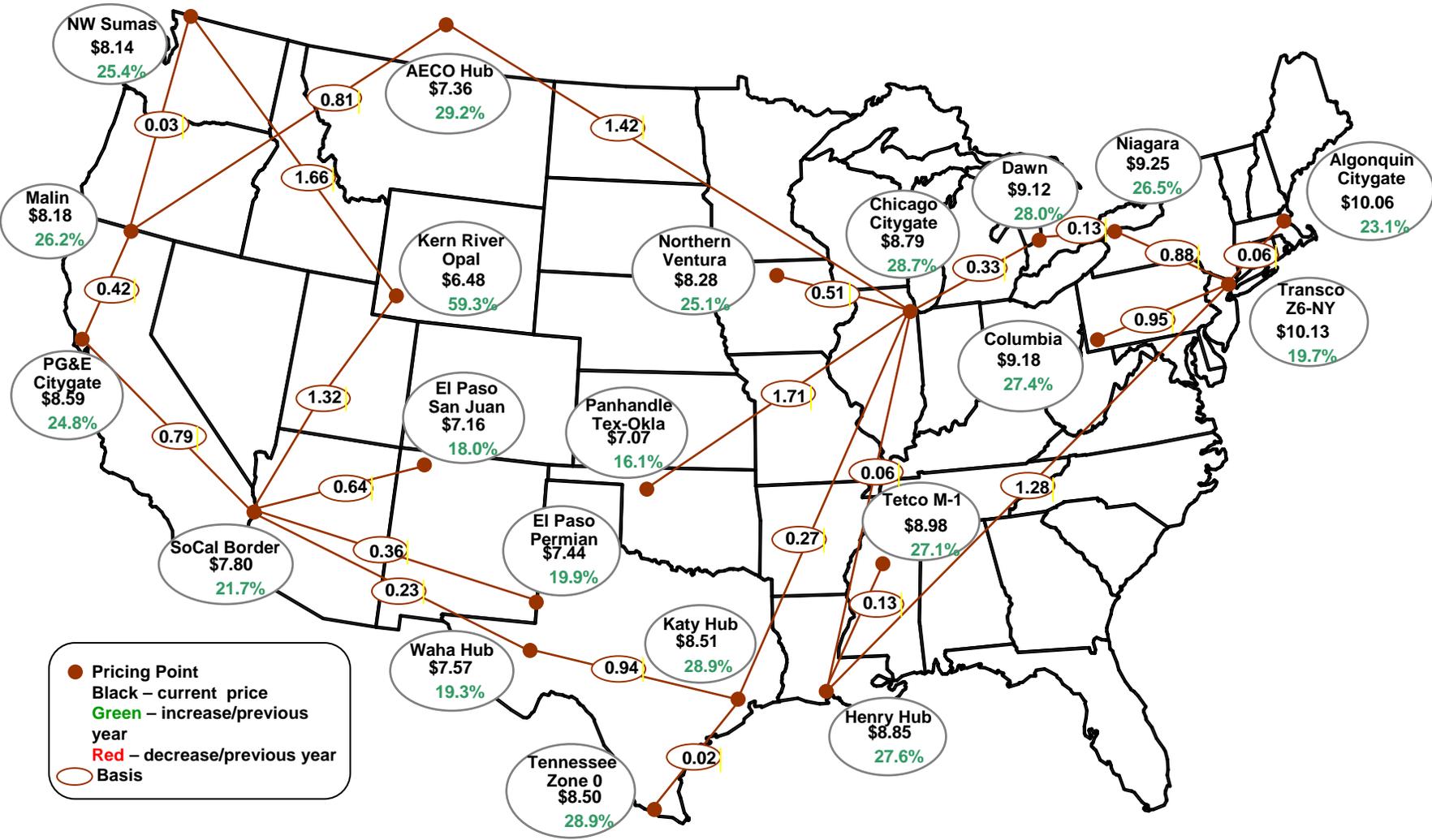


Source: Derived from Ventyx



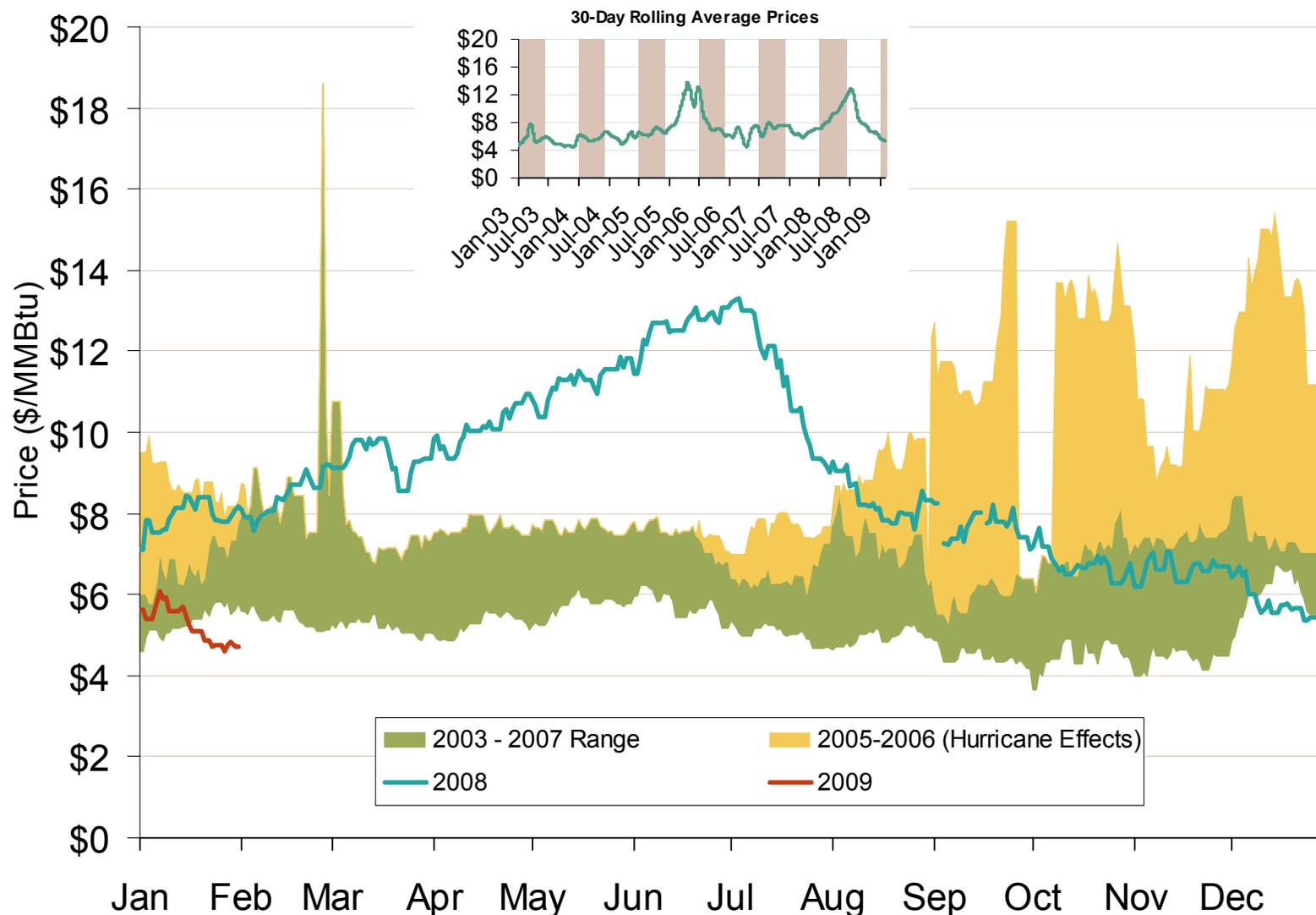
Natural Gas and Fuel Markets

Average Spot Gas Prices, 2008



Source: Derived from Platts data. February 2009 Western Snapshot Report

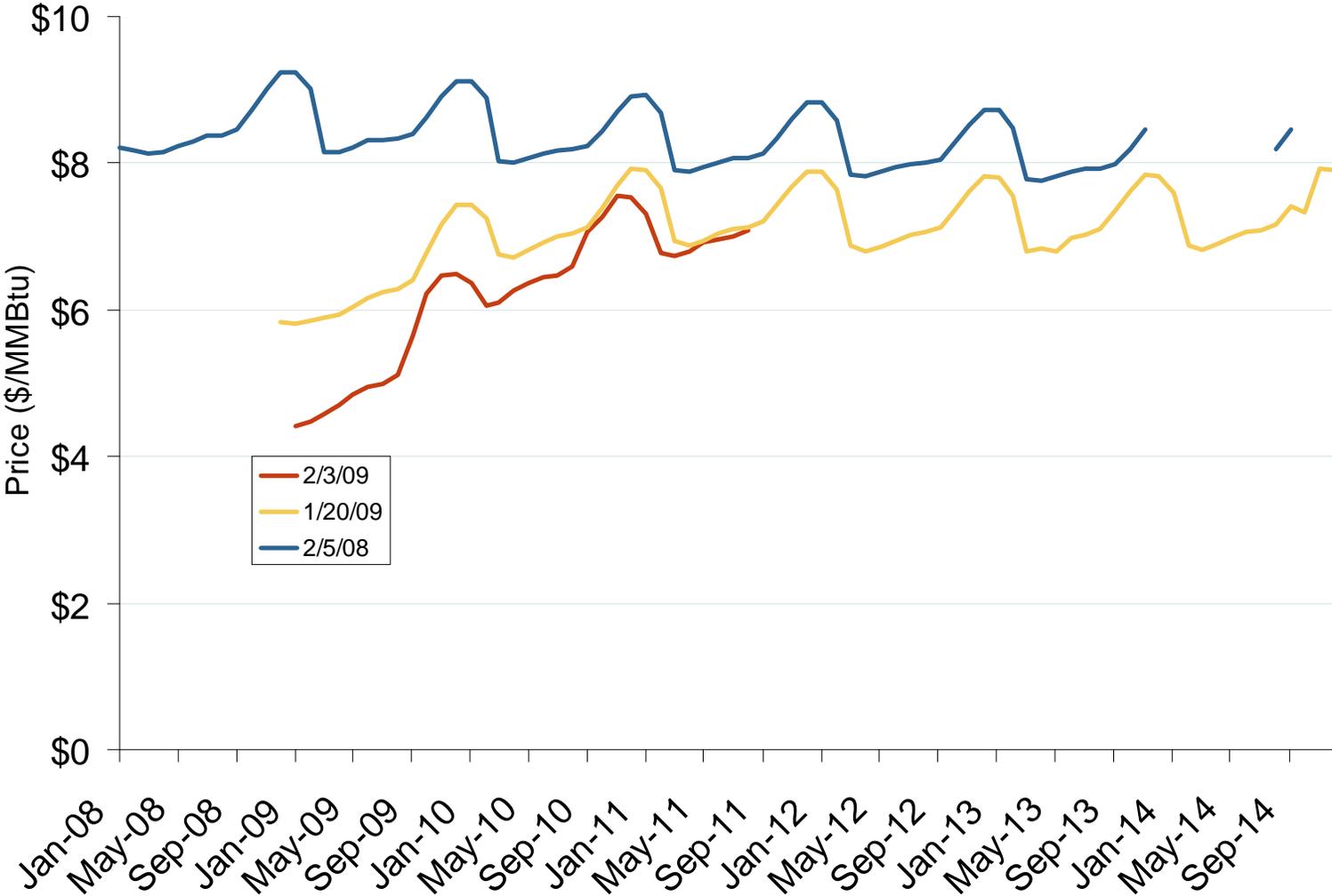
Henry Hub Natural Gas Daily Spot Prices 2008, 2009 and 2003-2007 Year Range



Source: Derived from *Platts* data.
February 2009 Western Snapshot Report

Updated February 6, 2009

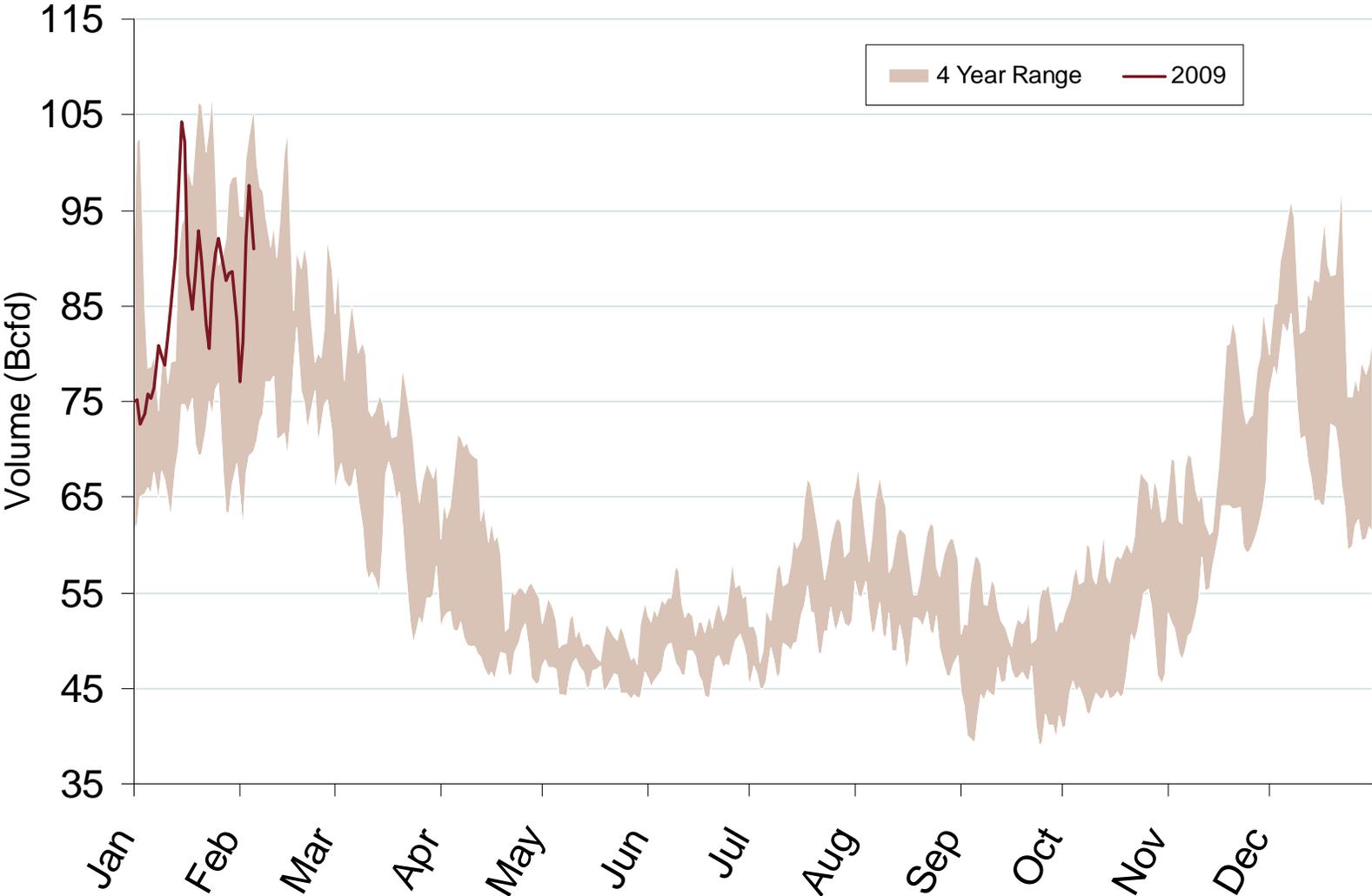
NYMEX Natural Gas Forward Price Curve



Source: Derived from NYMEX data.
February 2009 Western Snapshot Report

Updated February 6, 2009

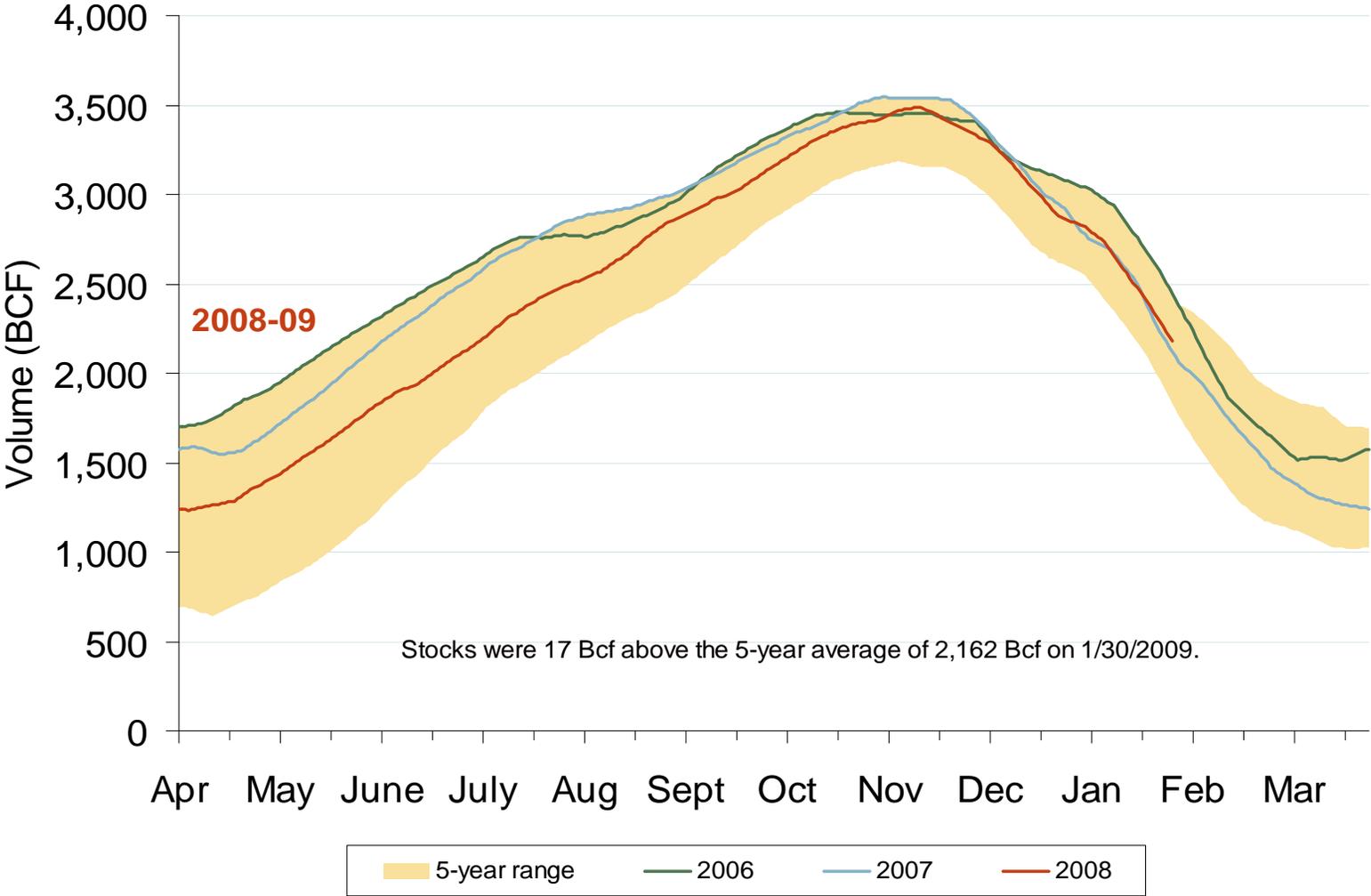
Total U.S. Natural Gas Demand (All Sectors)



Source: Derived from *Bentek Energy* data.
February 2009 Western Snapshot Report

Updated February 6, 2009

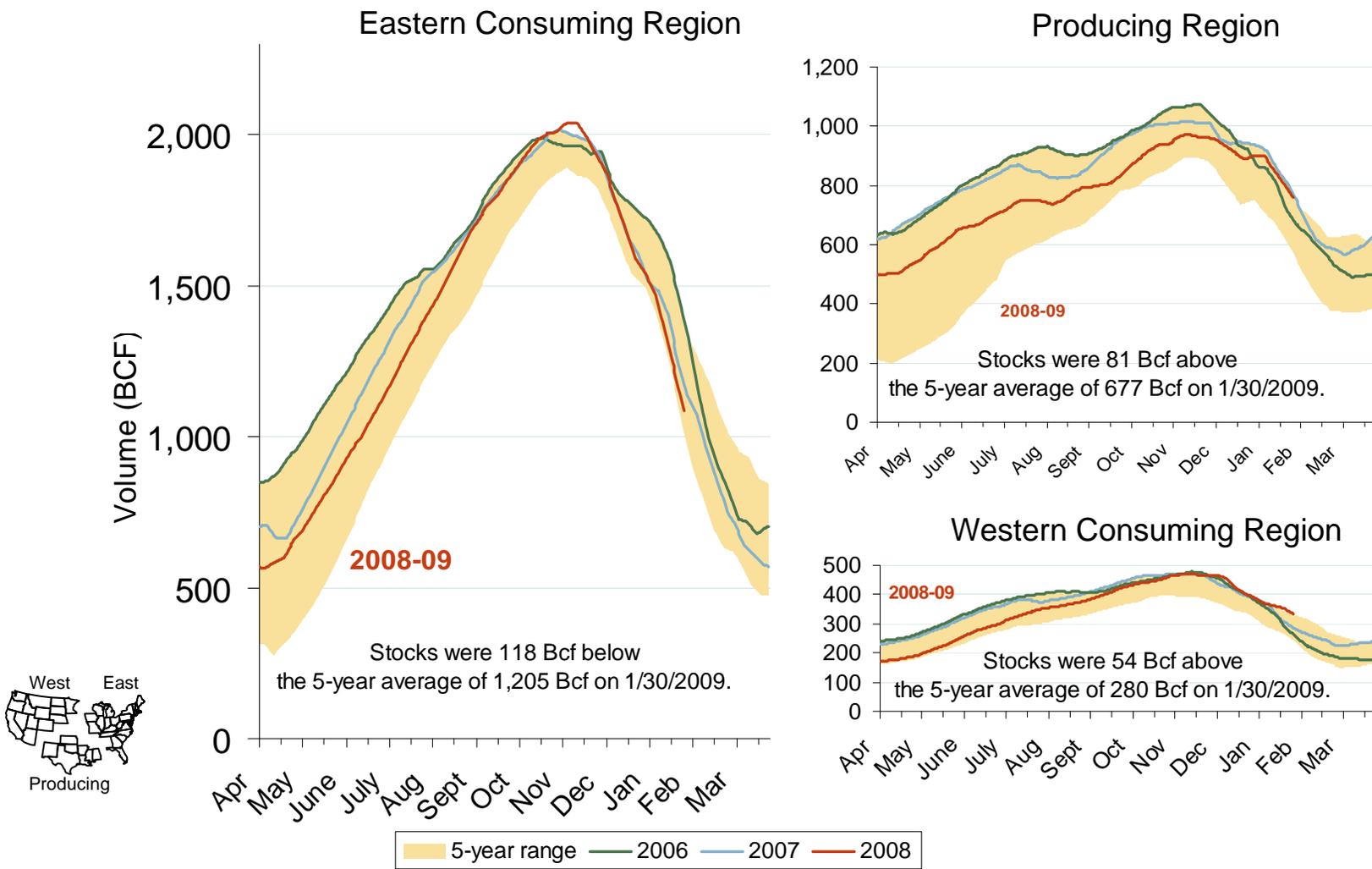
Total U.S. Working Gas in Storage



Stocks were 17 Bcf above the 5-year average of 2,162 Bcf on 1/30/2009.

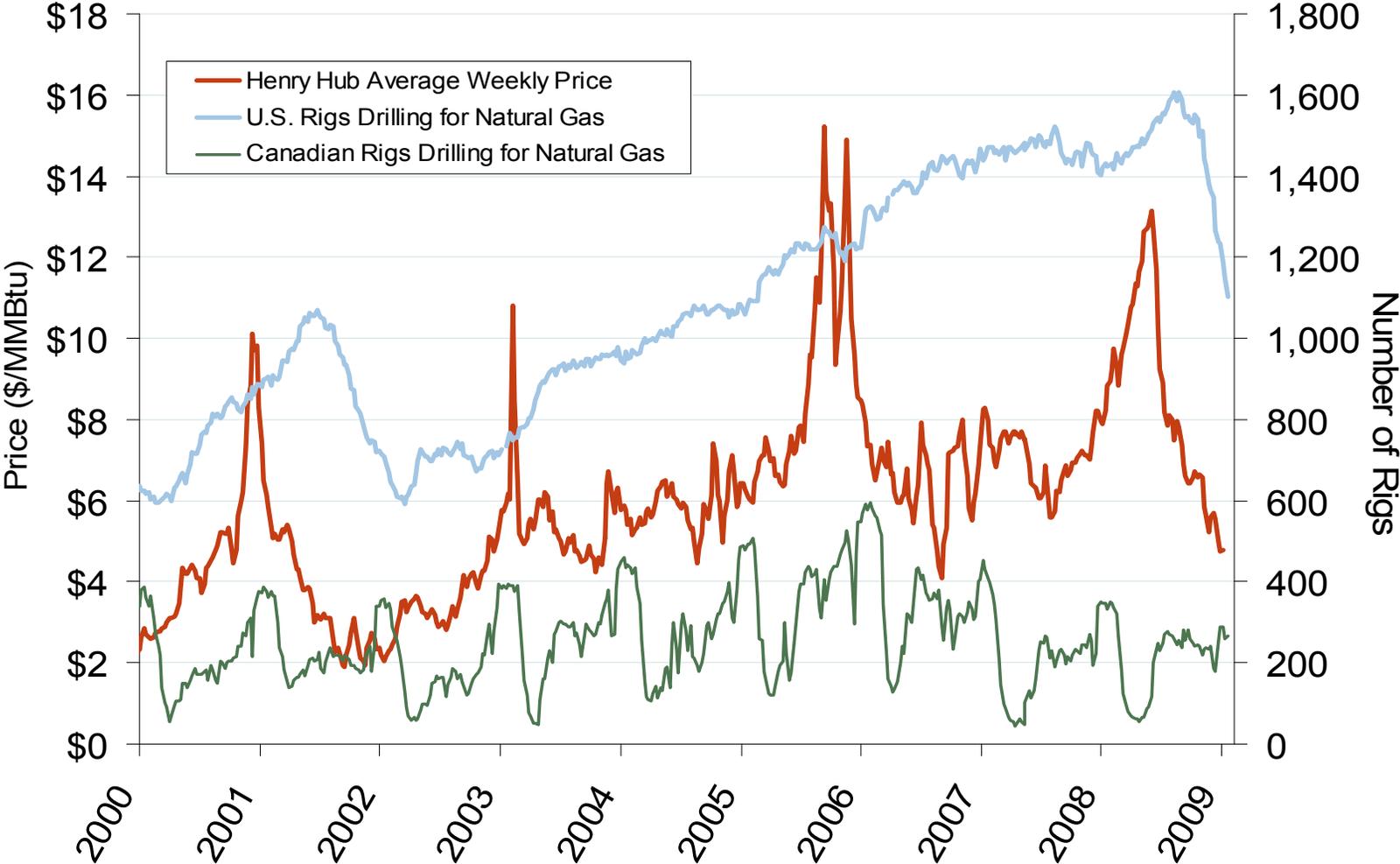
2008-09

Regional Totals of Working Gas in Storage



Source: Derived from EIA data.
February 2009 Western Snapshot Report

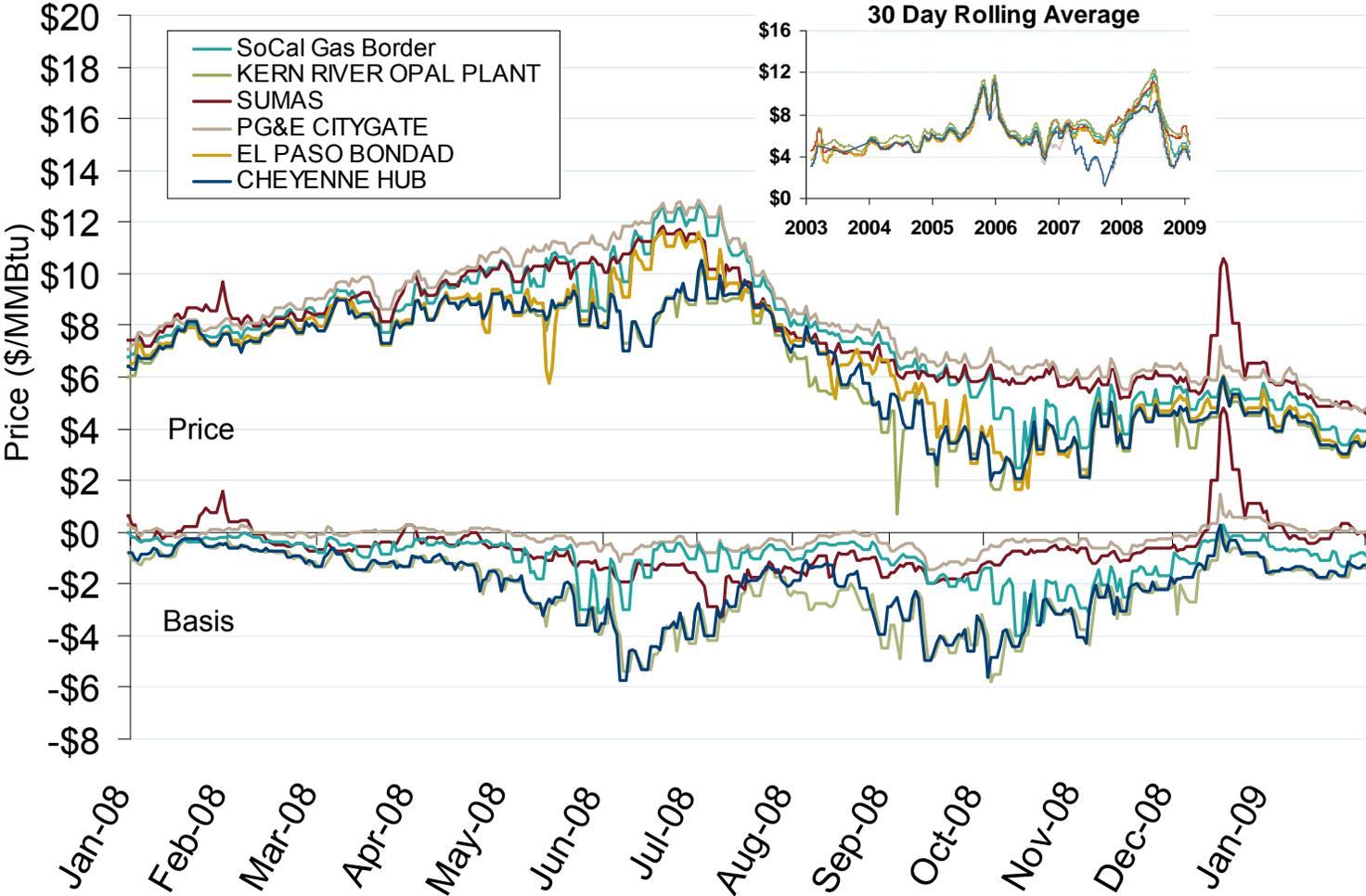
U.S. and Canadian Natural Gas Drilling Rig Count and Daily Spot Prices



Source: Derived from *Platts* and *Baker Hughes* data.
February 2009 Western Snapshot Report

Updated February 6, 2009

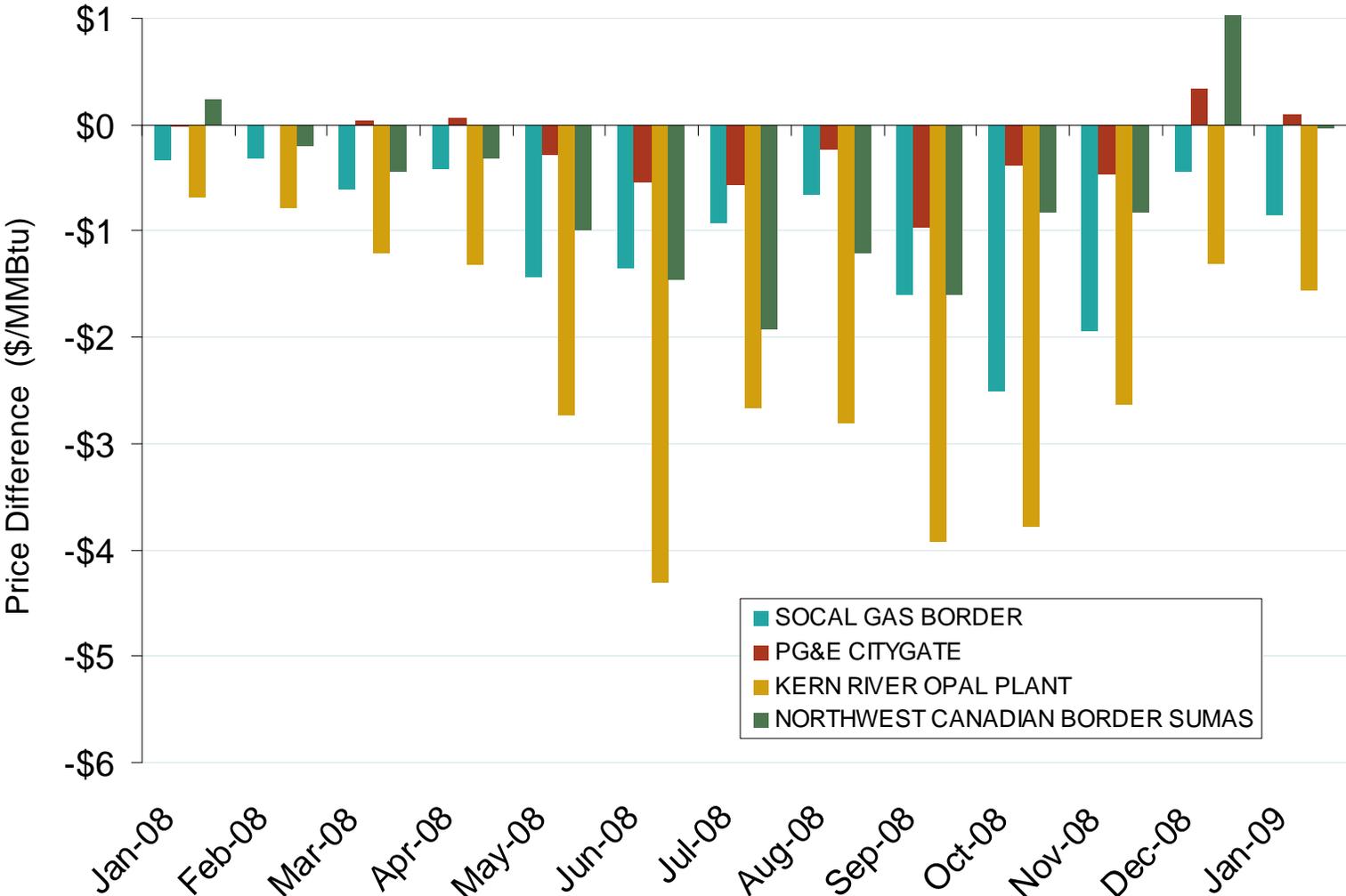
Western Day-Ahead Hub Spot Prices and Basis



Source: Derived from *Platts* data.
February 2009 Western Snapshot Report

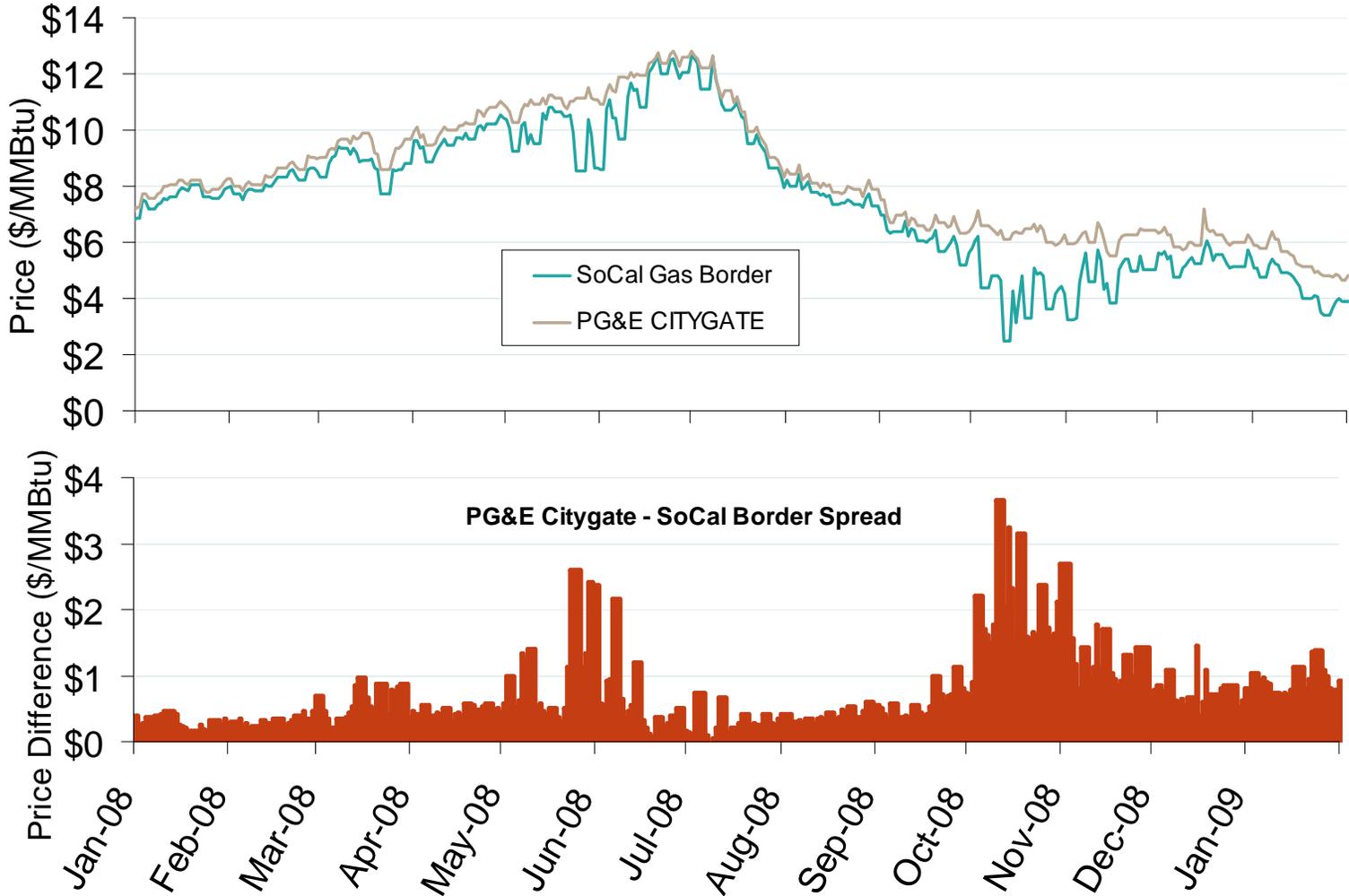
Updated February 6, 2009

Western Monthly Average Basis Value to Henry Hub



Source: Derived from Platts data.
February 2009 Western Snapshot Report

Difference in Northern and Southern California Daily Spot Prices



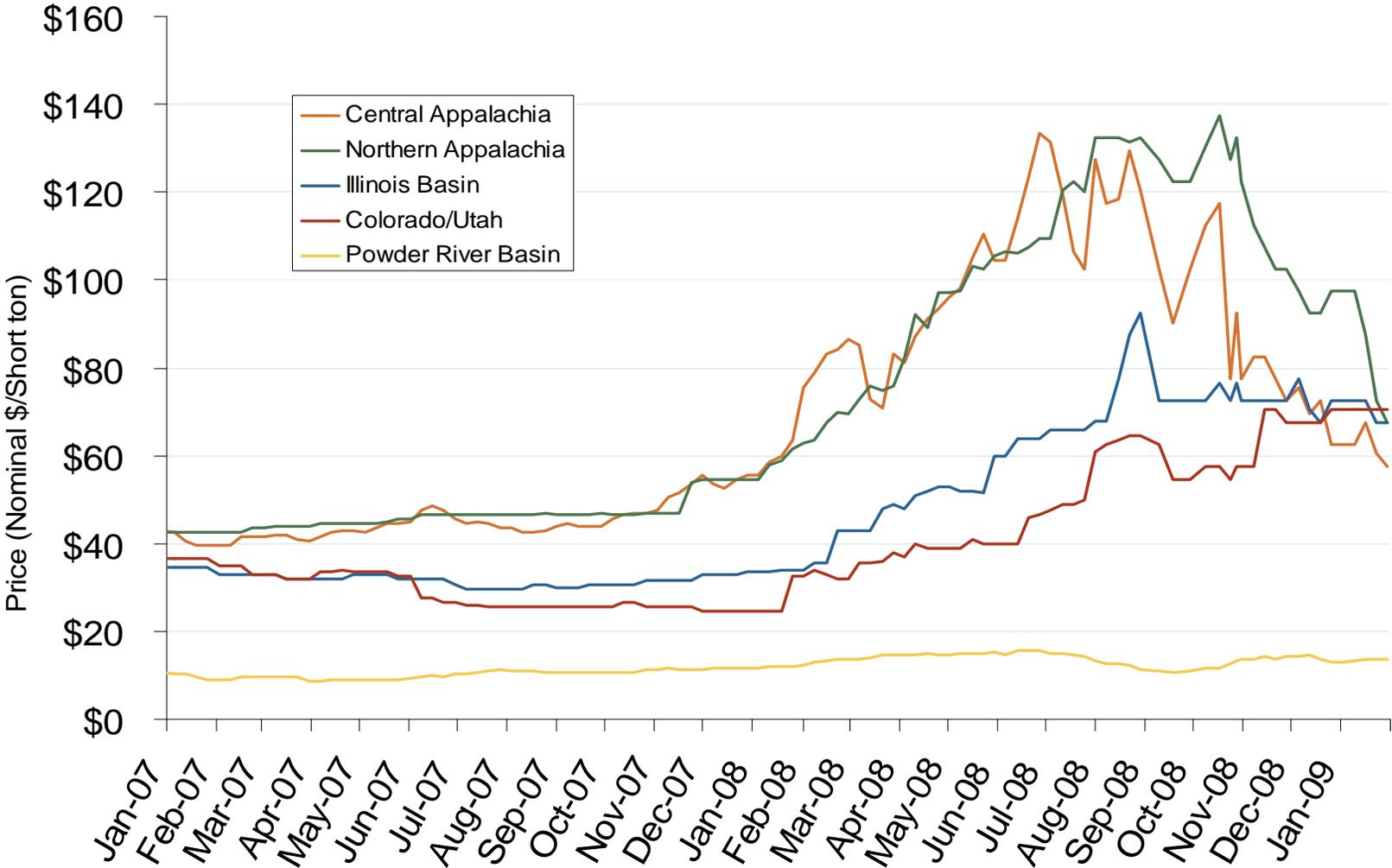
Source: Derived from *Platts* data.
February 2009 Western Snapshot Report

Natural Gas Winter Futures Strip and Daily Henry Hub Spot and Bidweek Prices



Source: Derived from *Platts* and *Nymex* data.
February 2009 Western Snapshot Report

Regional Coal Spot Prices

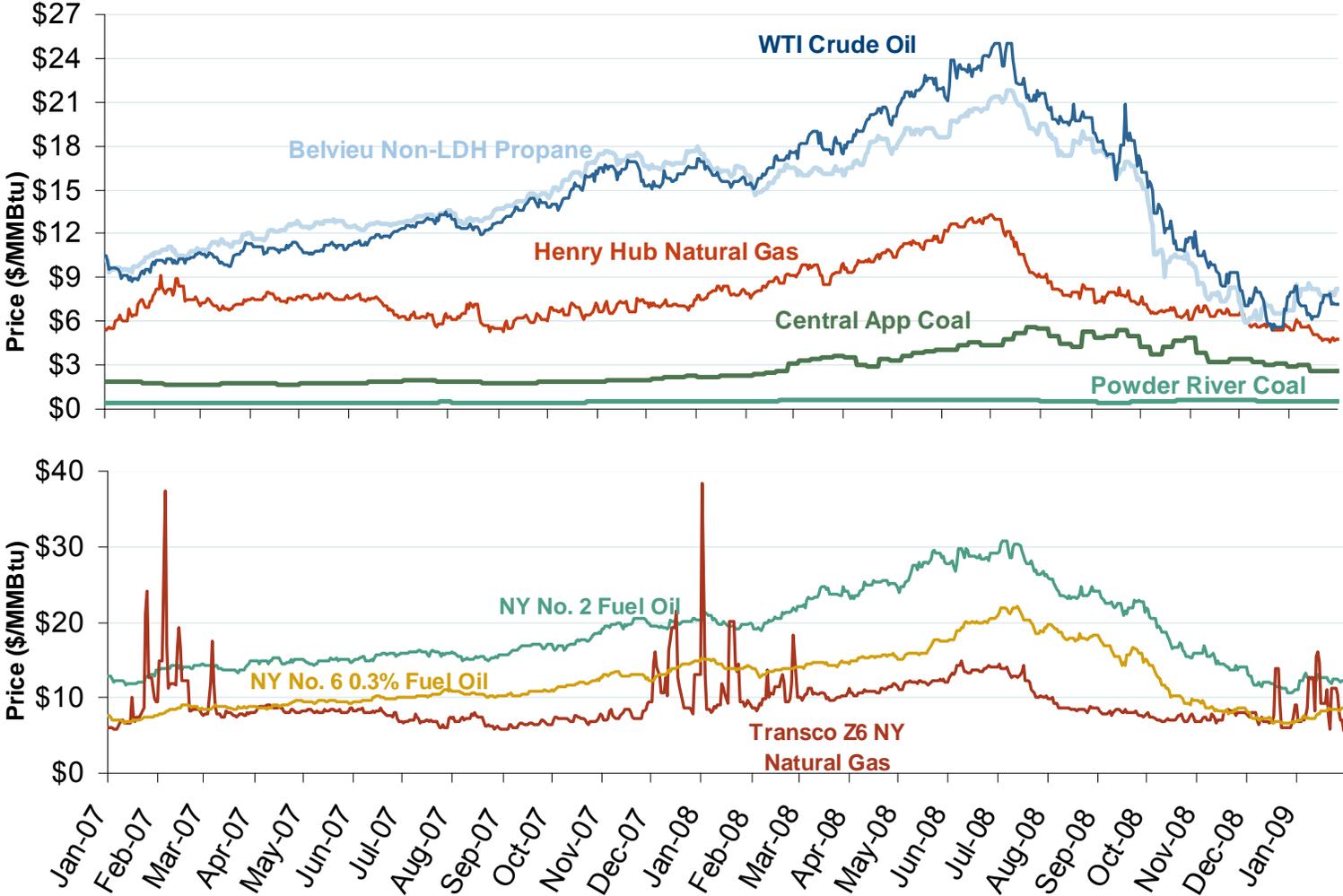


Note: Does not reflect the delivered price of coal; excludes incremental cost of emissions allowances.

Source: Derived from *Bloomberg* data.
February 2009 Western Snapshot Report

Updated February 6, 2009

Oil, Coal, Natural Gas and Propane Daily Spot Prices



Source: Derived from ICE and Bloomberg data.

Note: Coal prices are quoted in \$/ton. Conversion factors to \$/MMBtu are based on contract specifications of 12,000 btus/pound for Central Appalachian coal and 8800 btus/pound for Powder River Basin coal.

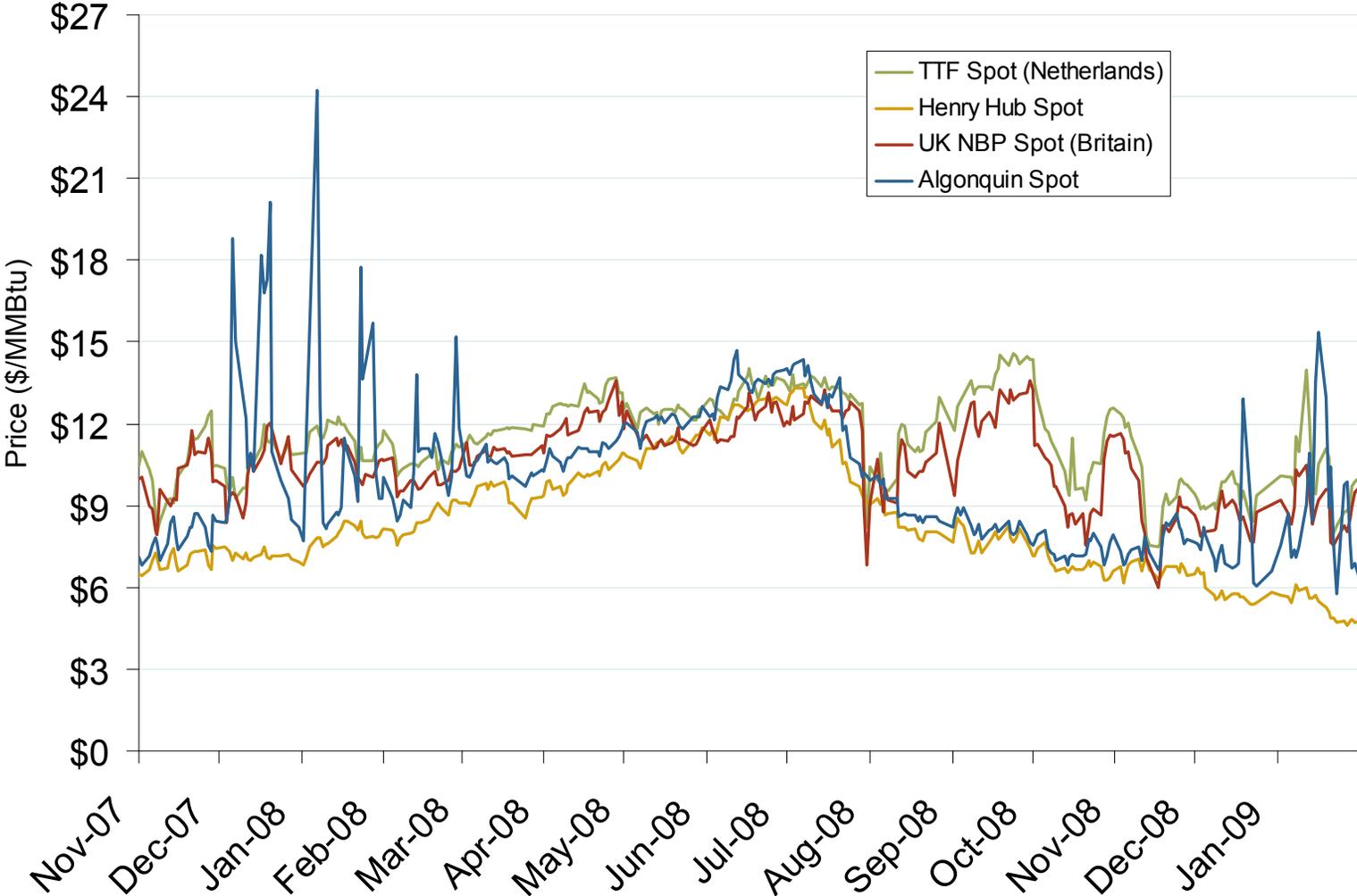
Updated February 6, 2009

Oil, Natural Gas and Currency Spot Prices



Source: Derived from *Bloomberg* data.

Atlantic Basin European and US Spot Natural Gas Prices



Source: Derived from *Bloomberg* and *ICE* data.
February 2009 Western Snapshot Report

Updated February 6, 2009

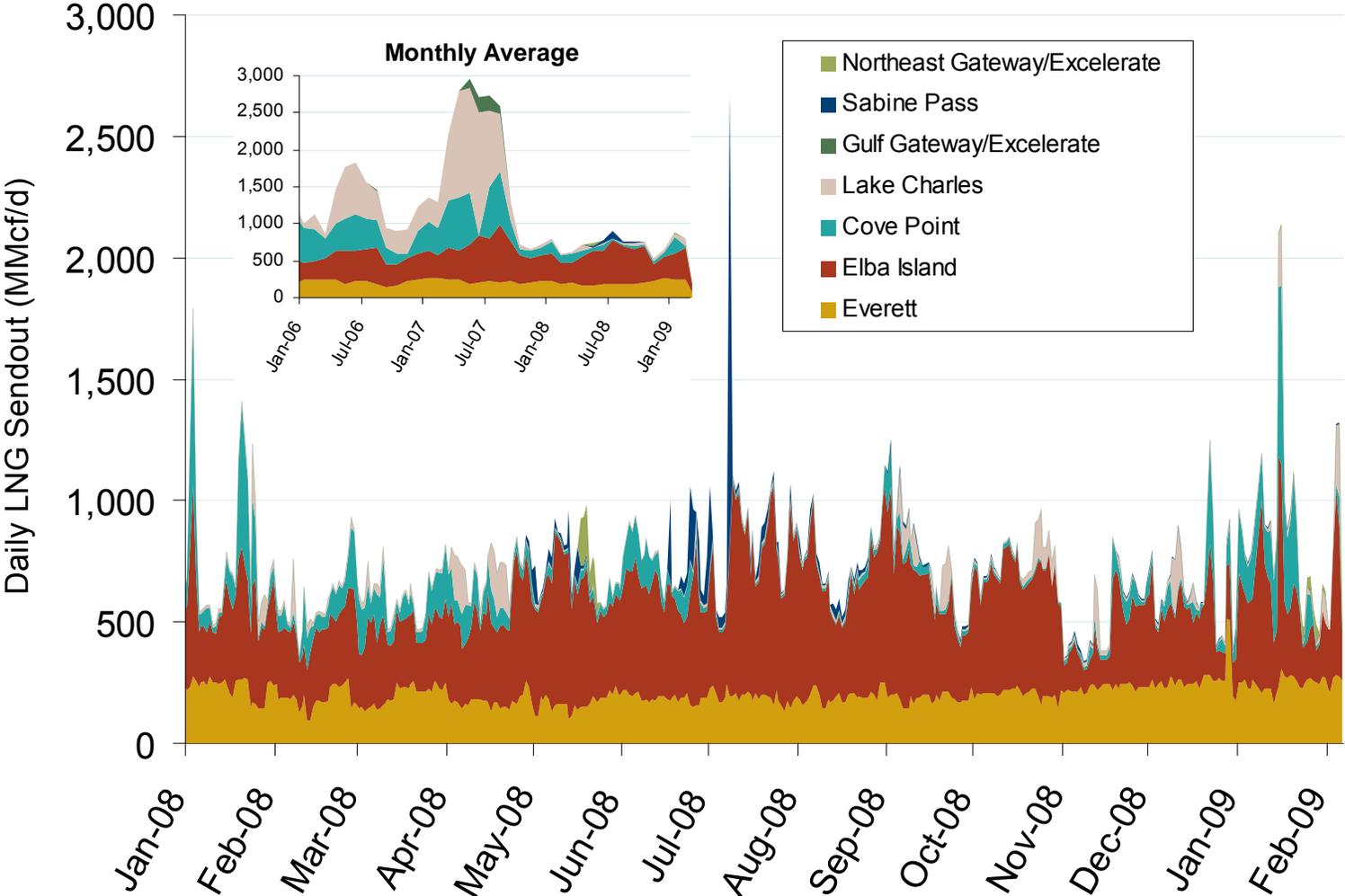
World LNG Estimated February 2009 Landed Prices



Source: Waterborne Energy, Inc. Data in \$US/MMBtu.
February 2009 Western Snapshot Report

Updated February 6, 2009

Daily Gas Sendout from Existing U.S. LNG Facilities

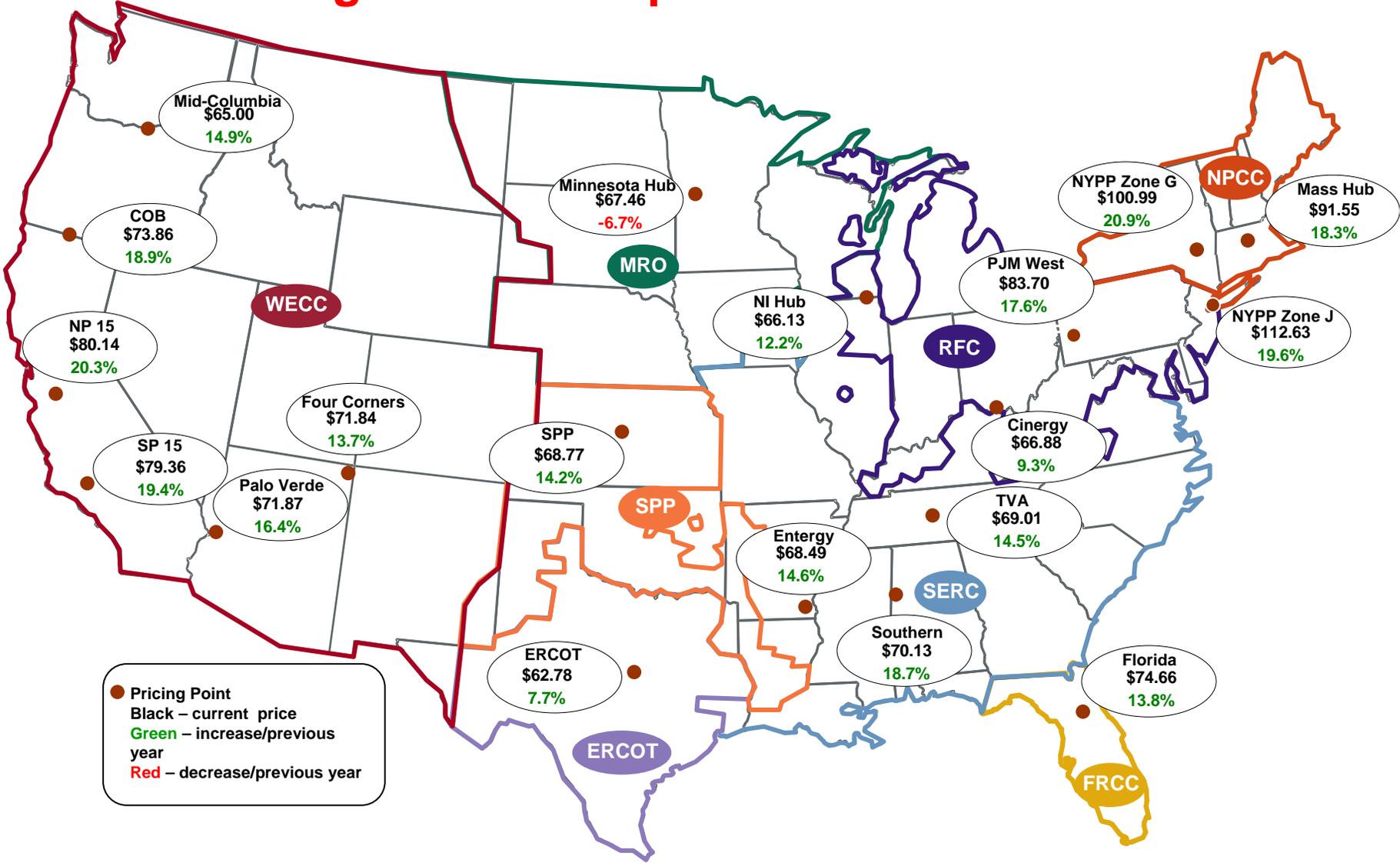


Source: Derived from *Bentek* data. Excludes Everett LNG delivered via truck and consumed by the Mystic plant as well as Freeport LNG which flows via intrastate pipelines.
 February 2009 Western Snapshot Report



Electricity Markets

Average On-Peak Spot Electric Prices 2008



Source: Derived from *Platts* data.
February 2009 Western Snapshot Report

Electric Market Overview: Regional Spot Prices

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

Regional Spot Prices: 2006-2008

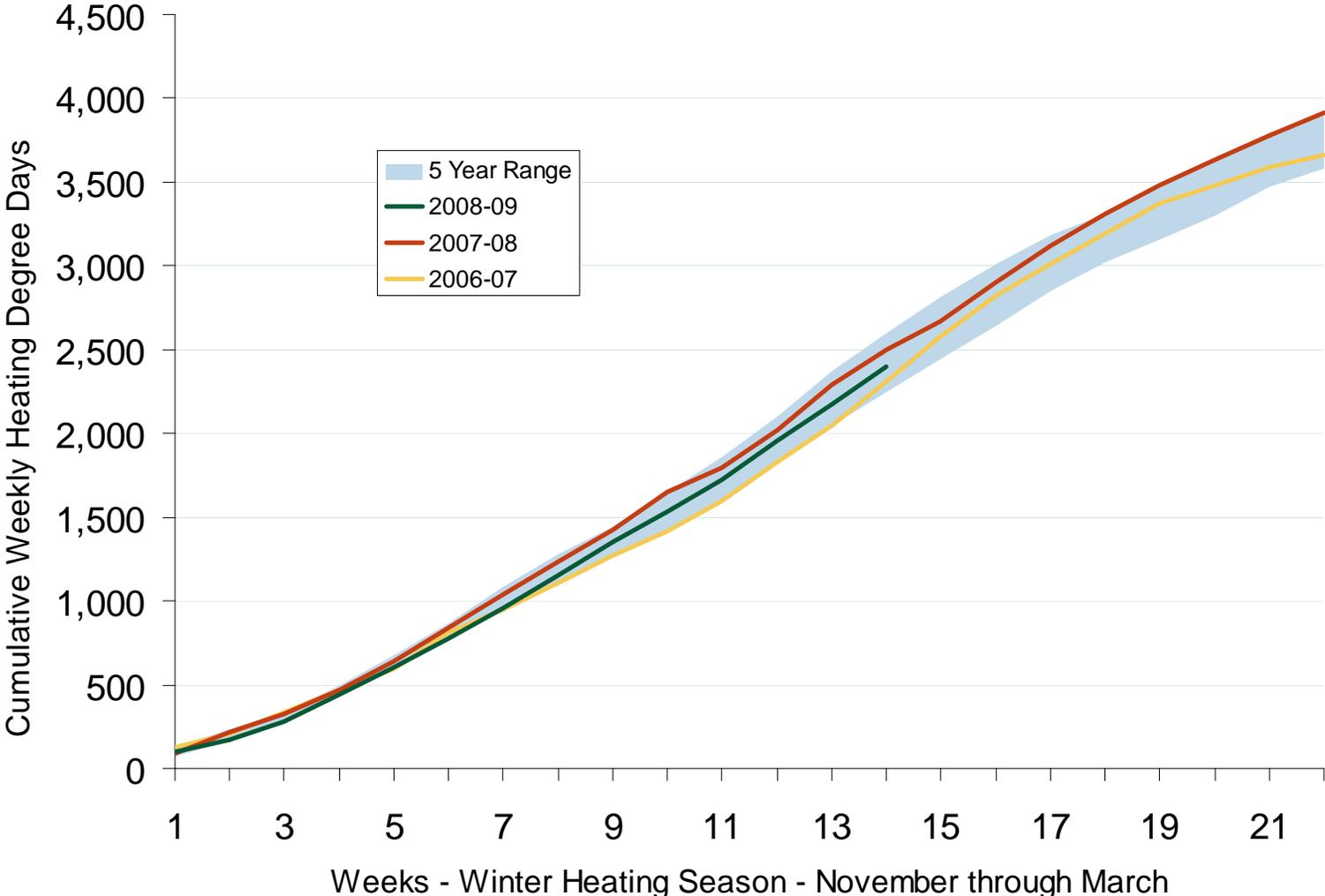
	On-peak Spot Prices					Off-peak Spot Prices				
	2006	2007	2008	% Change 06-07	% Change 07-08	2006	2007	2008	% Change 06-07	% Change 07-08
Northeast										
Mass Hub	69.85	77.39	91.55	10.8%	18.3%	47.93	54.73	66.50	14.2%	17.7%
Ny Zone G*	75.95	83.51	100.99	10.0%	20.9%		48.86	67.32		27.4%
NY Zone J*	85.96	94.15	112.63	9.5%	19.6%		53.66	70.29		23.7%
NY Zone A*	58.70	64.02	68.34	9.1%	6.7%		41.26	50.68		18.6%
PJM West	61.90	71.15	83.70	14.9%	17.6%	37.45	42.23	51.21	12.8%	17.5%
Southeast										
VACAR	56.34	60.52	70.86	7.4%	17.1%	34.98	33.67	39.36	-3.7%	14.4%
Southern	55.50	59.10	70.13	6.5%	18.7%	34.02	33.03	39.82	-2.9%	17.1%
TVA	53.48	60.28	69.01	12.7%	14.5%	33.08	33.56	38.61	1.5%	13.1%
Florida	64.02	65.59	74.66	2.5%	13.8%	39.79	35.80	41.35	-10.0%	13.4%
Entergy	56.28	59.74	68.49	6.2%	14.6%	34.20	31.88	35.26	-6.8%	9.6%
Midwest										
Cinergy	51.81	61.20	66.88	18.1%	9.3%	27.66	28.94	31.14	4.6%	7.1%
Michigan Hub	55.29	64.43	69.15	16.5%	7.3%	30.20	31.04	31.81	2.8%	2.4%
Minnesota Hub	59.47	72.32	67.46	21.6%	-6.7%	27.57	29.32	25.76	6.4%	-13.8%
NI Hub	52.52	58.93	66.13	12.2%	12.2%	29.09	29.32	31.24	0.8%	6.1%
Illinois Hub	51.32	59.88	62.52	16.7%	4.4%	26.41	27.40	26.29	3.8%	-4.3%
MAPP South	55.11	61.18	69.18	11.0%	13.1%	32.73	30.80	34.00	-5.9%	9.4%
South Central										
SPP North	55.84	60.21	68.77	7.8%	14.2%	33.96	31.24	33.66	-8.0%	7.2%
ERCOT	57.83	58.27	62.78	0.8%	7.7%	39.03	38.83	38.36	-0.5%	-1.2%
Southwest										
Four Corners	58.52	63.21	71.84	8.0%	13.7%	37.91	40.19	49.40	6.0%	18.7%
Palo Verde	57.59	61.74	71.87	7.2%	16.4%	38.21	41.94	52.16	9.8%	19.6%
Mead	59.93	64.49	75.63	7.6%	17.3%	39.92	44.15	54.90	10.6%	19.6%
Northwest										
Mid-C	50.18	56.57	65.00	12.7%	14.9%	38.71	44.00	53.70	13.7%	18.1%
COB	55.58	62.14	73.86	11.8%	18.9%	40.71	46.38	55.81	13.9%	16.9%
California										
NP15	61.08	66.59	80.14	9.0%	20.3%	40.77	47.10	59.22	15.5%	20.5%
SP15	61.95	66.48	79.36	7.3%	19.4%	41.62	46.76	57.86	12.4%	19.2%

Note: * Off Peak as of April 2, 2007.

Regional Electric and Input Prices: 2006-2008

Electricity and Input Prices, 2006-08			
	2006	2007	2008
Electric Spot Prices (On-Peak \$ per MWh)			
Mass Hub	\$69.85	\$77.39	\$91.55
Cinergy	\$51.81	\$61.20	\$66.88
SP-15	\$61.95	\$66.48	\$79.36
Input Prices			
Natural Gas (\$ per MMBtu)			
Henry Hub	\$6.74	\$6.94	\$8.85
New York	\$7.37	\$8.46	\$10.13
Southern California	\$6.10	\$6.41	\$7.80
Coal (\$ per ton)			
Central Appalachian (Eastern)	\$51.64	\$45.00	\$92.37
Powder River Basin (Western)	\$13.21	\$10.24	\$13.62
Emissions (\$ per ton)			
SO ₂ Allowances	\$738.12	\$527.58	\$280.43
NO _x allowances	\$1,862.03	\$815.87	\$786.64
Oil			
WTI (Crude - \$ per barrel)	\$66.12	\$72.45	\$99.63
Residual Fuel, New York (\$ per barrel)	\$55.07	\$64.35	\$91.94
Distillate Fuel, New York (\$ per gallon)	\$2.04	\$2.22	\$3.08

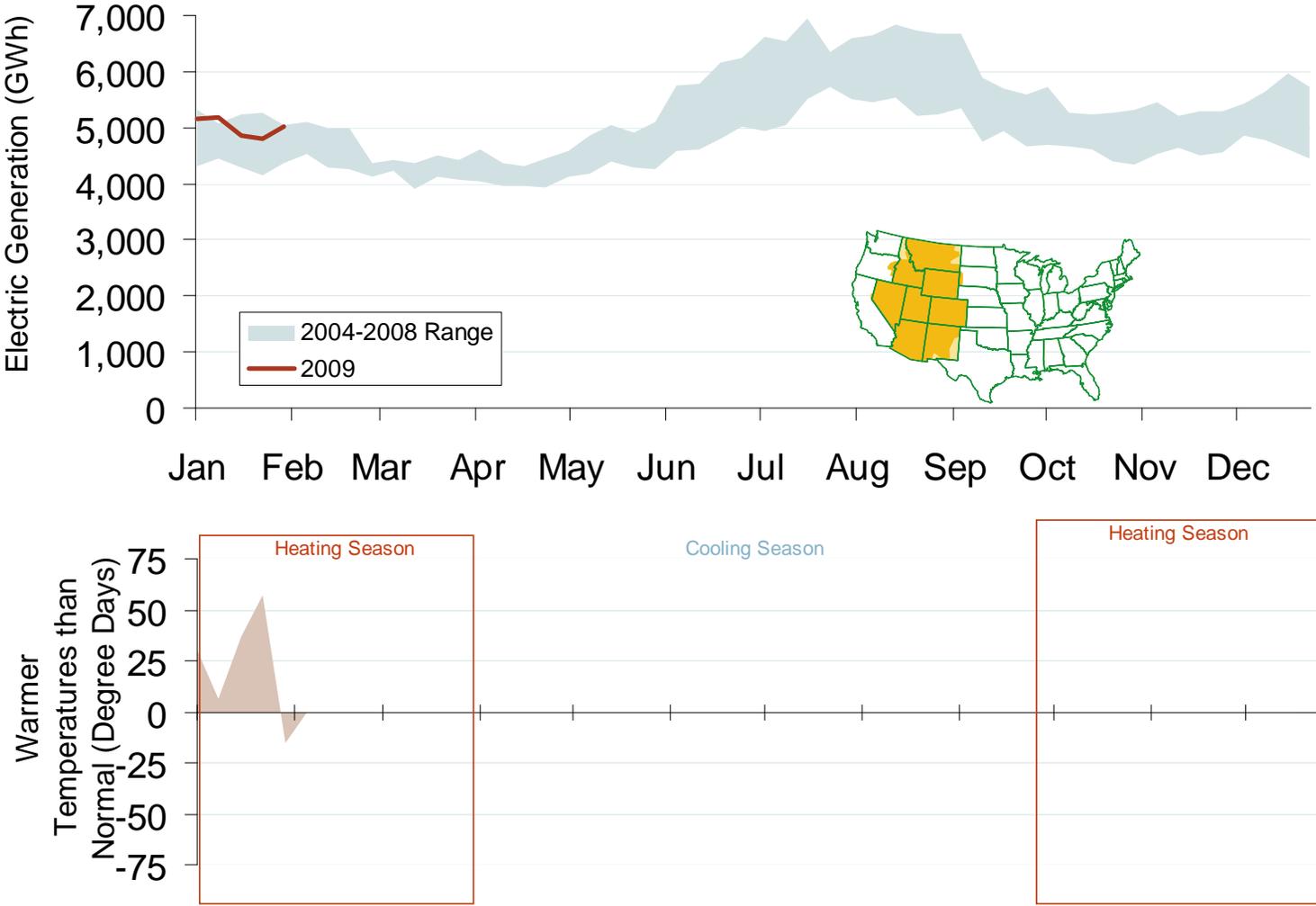
U. S. Winter Cumulative Heating Degree Days



Source: Derived from NOAA data.
February 2009 Western Snapshot Report

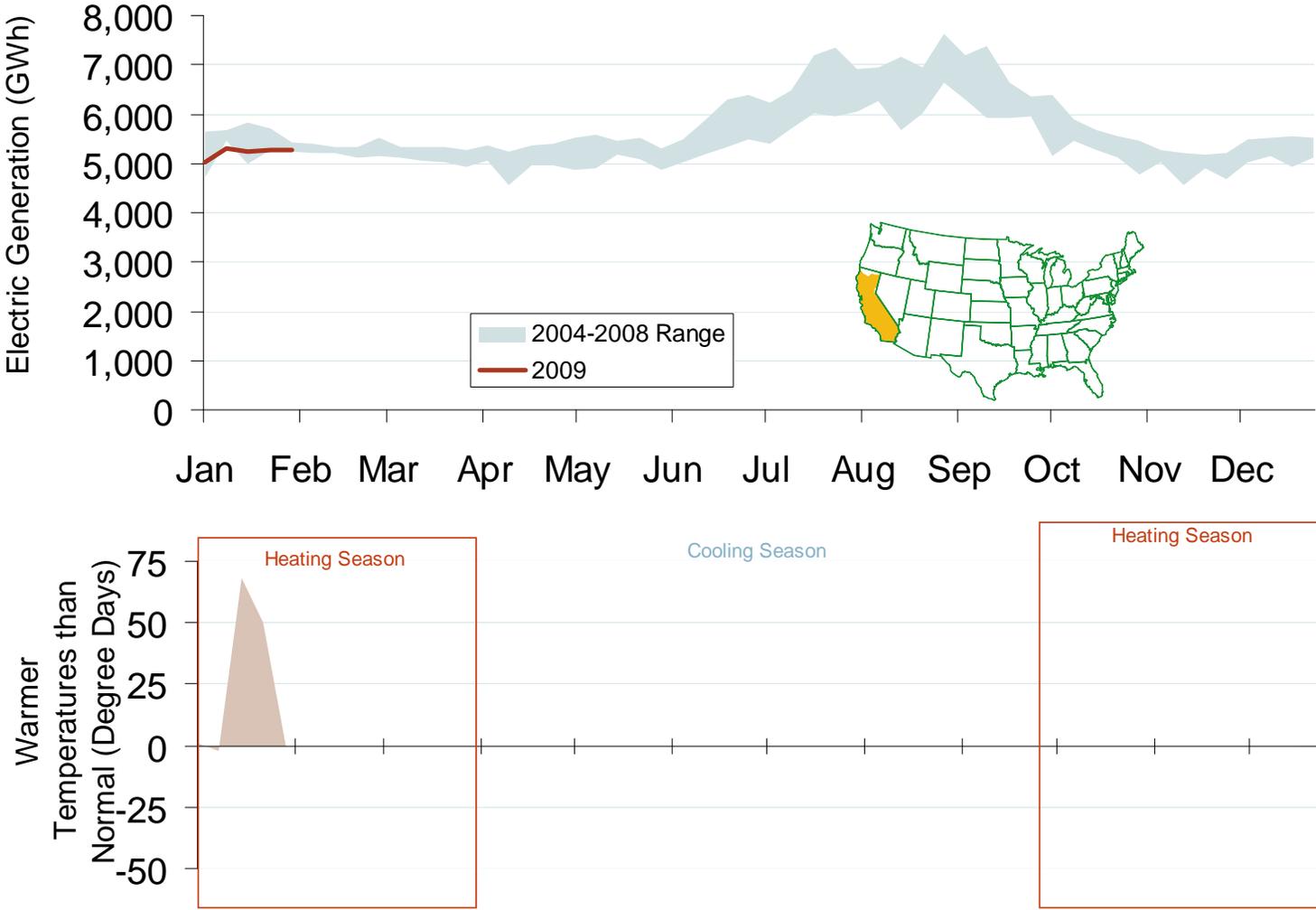
Updated February 6, 2009

Weekly Electric Generation Output and Temperatures Rocky Mountains Region



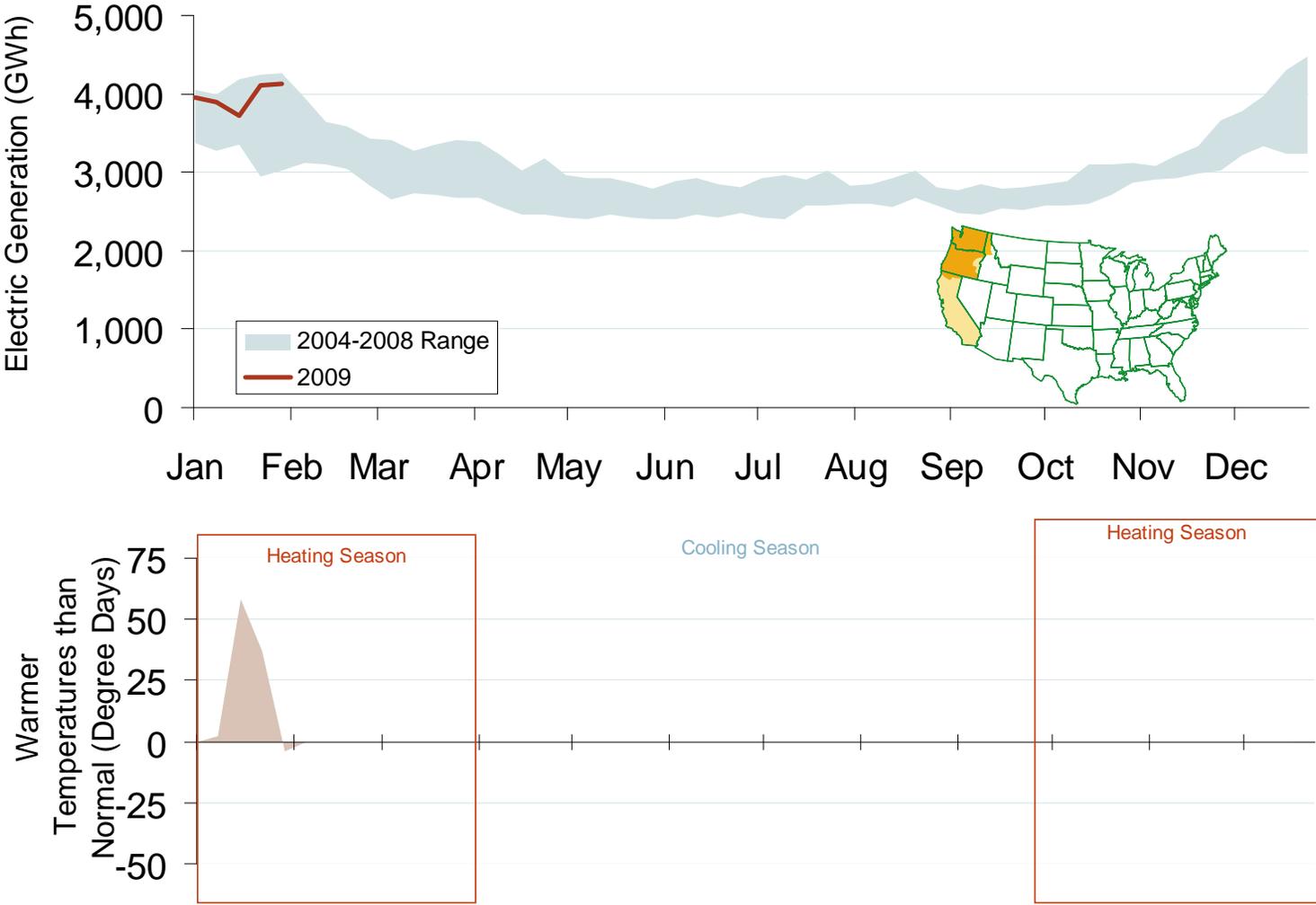
Source: Derived from *EEl* and *NOAA* data.
February 2009 Western Snapshot Report

Weekly Electric Generation Output and Temperatures California



Source: Derived from *EEl* and *NOAA* data.
February 2009 Western Snapshot Report

Weekly Electric Generation Output and Temperatures Pacific Northwest Region



Source: Derived from *EEl* and *NOAA* data.
February 2009 Western Snapshot Report

Updated February 6, 2009

Pacific/Northwest Hydro and Snowpack Levels

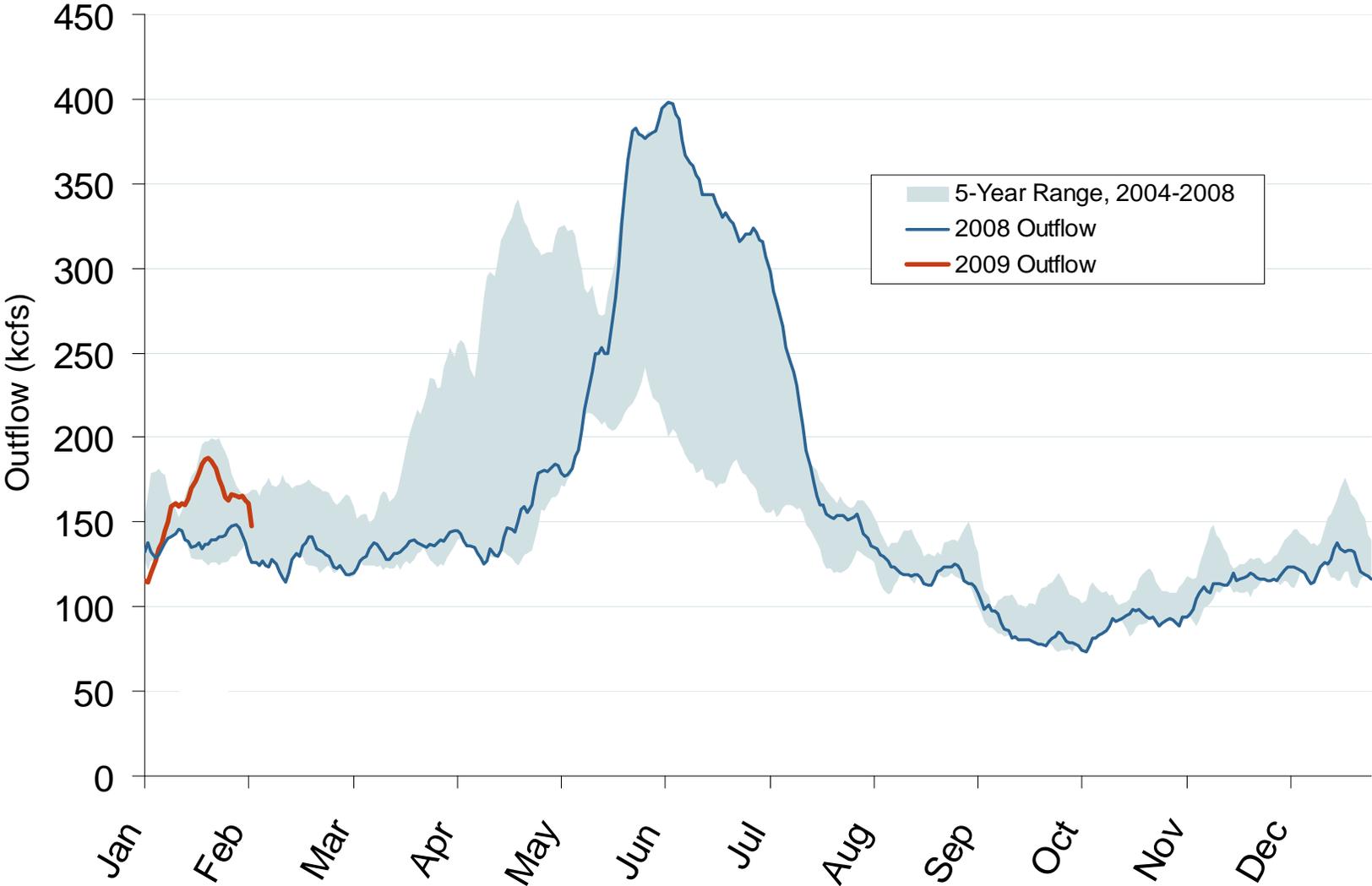
	Hydro Generation		Snow Water Equivalent ³		
	In-State Capacity (MW) ¹	Additional Capacity Created Downstream (MW) ²	One Year Ago (% of average)	1/7/09 1/14/09 (% of average)	2/2/09 (% of average)
Washington	21,500	0	124%	97% 94%	79%
Oregon	9,100	0	153%	123% 100%	84%
California	10,400	0	117%	74% 68%	67%
Idaho	2,700	19,700	106%	104% 101%	90%
Montana	2,700	16,200	102%	97% 106%	91%
British Columbia	10,000	16,200	112%	83% 98%	84%

¹ Net summer capacity in megawatts by state (EIA).

² Approximate electric capacity created by water flow through the downstream states (EIA and BPA). The capacity estimates reflect the water flow pattern of the series of hydro facilities on the Snake and Columbia Rivers.

³ Snow Water Equivalent, in percent of the historical average for the same date, is the ratio of current snow water daily data (collected by the Natural Resources Conservation Services' Snowtel Telemetry sites) compared to the average snow water for the same day between 1961-1990. Total Hydro Capacity figures by state do not tie precisely to Snow Water Equivalent data due to such factors as snow basin terrain and complex distribution of run-off to neighboring state hydroelectric dams or shared facilities (e.g., Columbia River hydroelectric dams on the border of Washington and Oregon) (Bloomberg, California Dept. of Water Resource and Government of British Columbia Ministry of Environment).

Stream Flow at The Dalles Dam



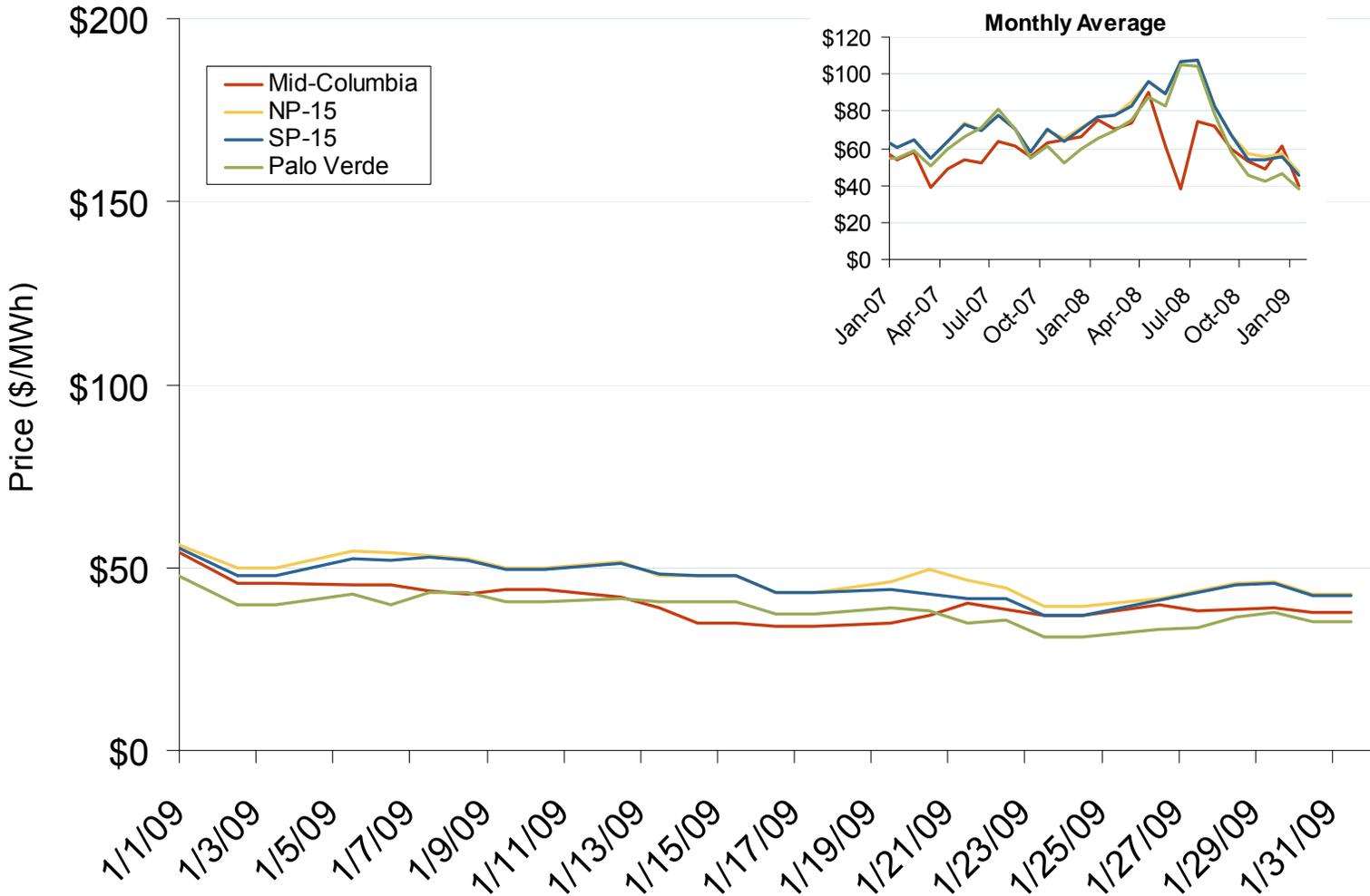
Source: Derived from USACE data.

Trend lines are 7-day moving averages.

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Updated February 6, 2009

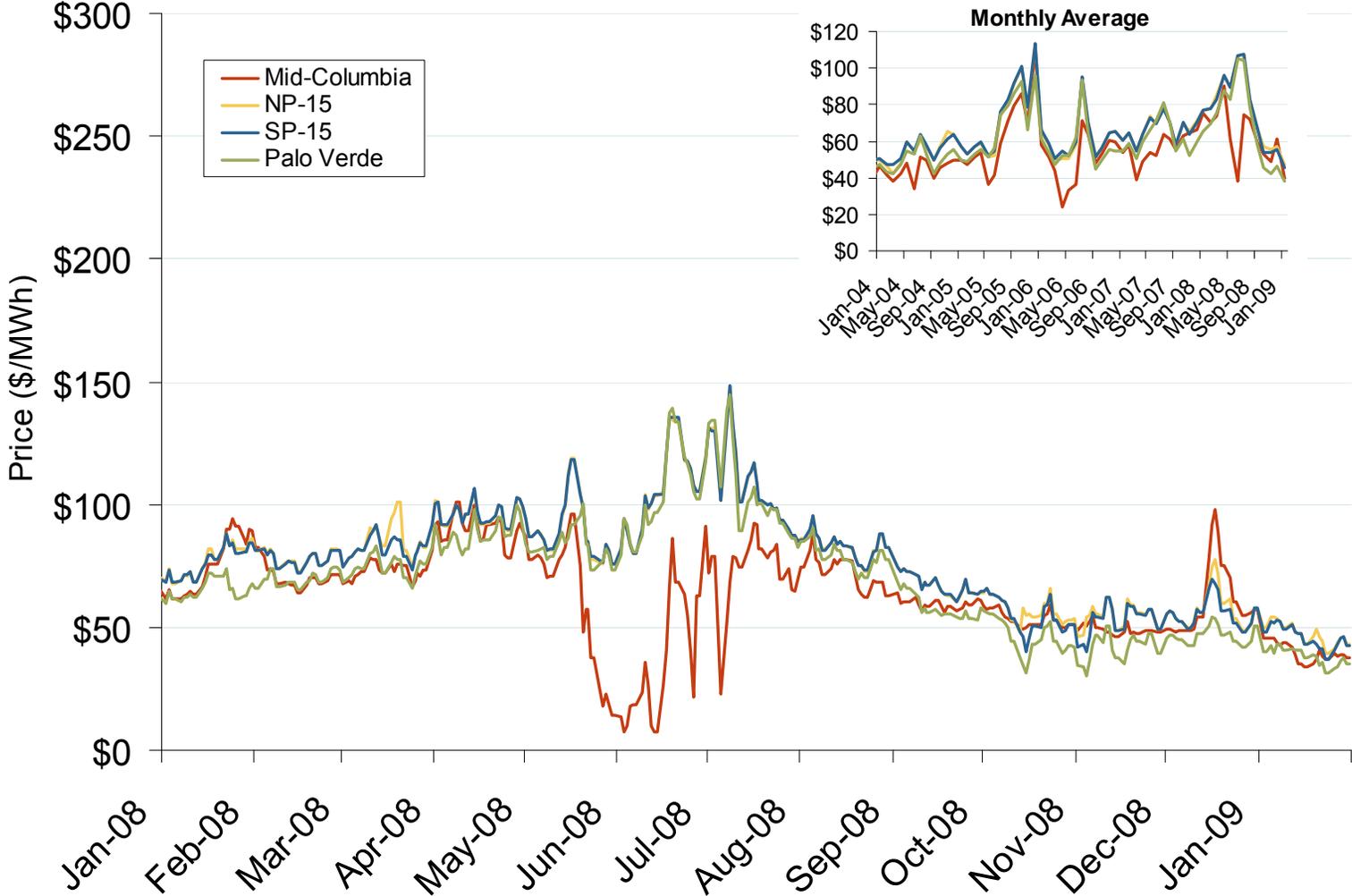
Western Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.
February 2009 Western Snapshot Report

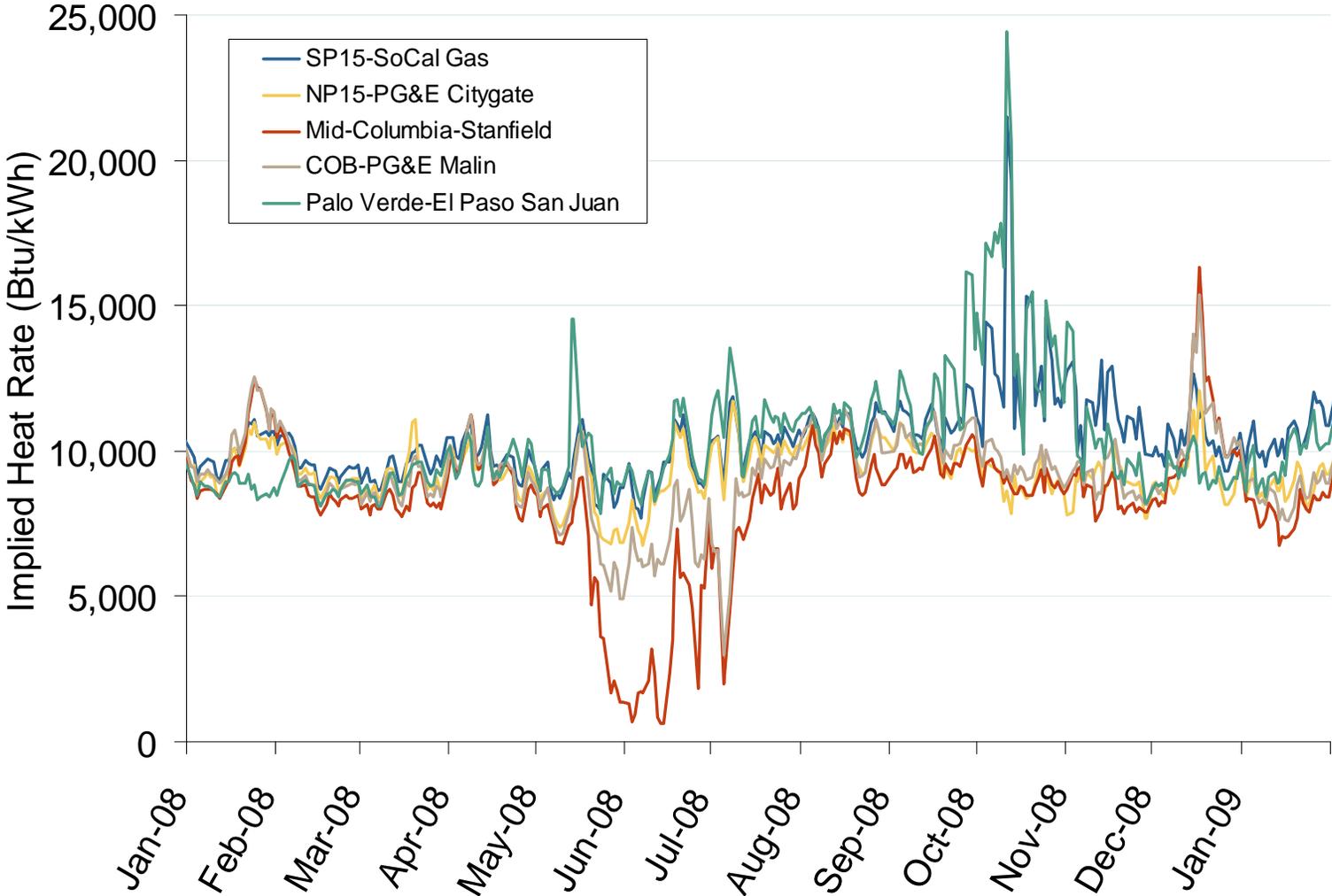
Updated February 6, 2009

Western Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from Platts data.
February 2009 Western Snapshot Report

Implied Heat Rates at Western Trading Points



Source: Derived from *Platts* data
February 2009 Western Snapshot Report

Collaborative Greenhouse Gas (GHG) Programs

Collaborative Regional GHG Programs:

- Three North American groups with goals to lower regional GHG emissions were initiated by state Governors.
- 32 U.S. states, D.C., eight Canadian provinces, and six Mexican states are Participants or Observers.
- Observer jurisdictions do not commit to group GHG reduction goals, but participate in proceedings should they opt to join later. RGGI Observers are not on its Board.

Western Climate Initiative (WCI):

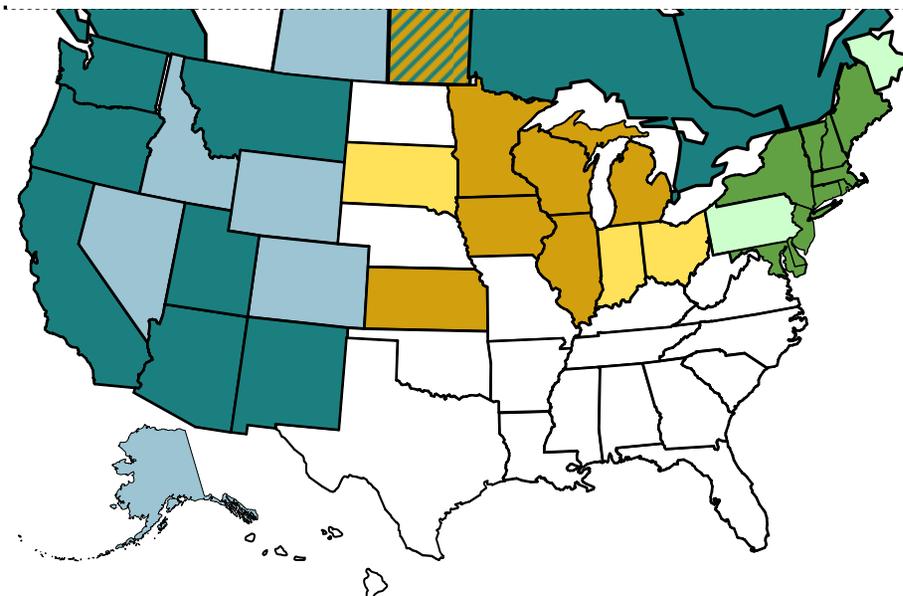
- Created February 2007
- Partners: 7 states, 4 provinces; Observers: 5 states, 1 province*
- WCI announced its design for a market-based, *multi-sector* cap-and-trade program, Sept 2008:
 - 15% CO₂ reduction below 2005 levels by 2020
 - Phase I to take effect Jan 2012

Midwest Greenhouse Gas Reduction Accord:

- Established November 2007
- Participants: 6 states, 1 province; 3 Observer states, 1 province
- Preliminary Design Recommendations issued Dec 2008: 15 - 25% reductions by 2020, 60 - 80% by 2050

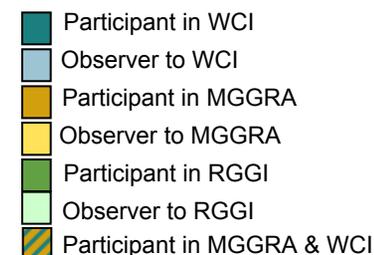
Regional Greenhouse Gas Initiative (RGGI):

- Compliance period began Jan 1, 2009
- 10 Participant states; 5 Observers jurisdictions
- Market-based cap-and-trade effort to reduce *power-sector* CO₂ emissions.
- 10% CO₂ reduction by 2018 covers over 200 plants
- 188 million allowances (to be) sold in 2 pre-compliance auctions (2008) and 4 compliance auctions (2009)



Auctions:

1. **9/25/08:** 12.5 million allowances sold by 6 states cleared at \$3.07/allowance
2. **12/17/08:** 31.5 million allowances sold by all 10 states cleared at \$3.38/allowance
3. **3/18/09:** 1st compliance auction, 10 states to sell 31.5 million 2009 allowances and 2.2 million 2012 vintage allowances



Updates at: <http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-ghg.pdf>

Notes: Kansas is a MGGRA participant and WCI observer. Ontario and Quebec are Partners to WCI and Observers to RGGI; Ontario is also an observer to RGGI.

Sources: regional initiatives - www.rggi.org, www.midwesternaccord.org, www.westernclimateinitiative.org, trade press, Pew Center, White House - www.whitehouse.gov/agenda/energy_and_environment

Collaborative Greenhouse Gas Programs

White House Energy & Environment Agenda:

- President Obama has called for an economy-wide cap-and-trade program to reduce emissions to 1990 levels by 2020 and to reduce them an additional 80% by 2050.

RGGI's Auction 2 held on December 17, 2008:

- Six states from 1st auction sell 1/6 of 2008-09 allowances in Auctions 1-6: CT, MA, ME, MD, RI, VT.
- DE, NH, NJ, and NY passed legislation necessary to participate in auctions; they sell 20% of allowances in each of Auctions 2-6.
- 69 entities bid for 3.5 times the available 31.5 million allowances in Auction 2, raising \$106.5 million.
- Of 46 winning entities, 85% were compliance entities (generators), and 12% were financial institutions or traders.
- Shares cleared at \$3.38/allowance, 31¢ higher than Auction 1, although the base price remained at \$1.86/allowance.

RGGI Updates:

- The 1st compliance auction is scheduled for March 18.
- Ten states will sell 31.5 million 2009 vintage allowances and 2.2 million 2012 vintage allowances.
- Ten participating RGGI states and Pennsylvania signed a Letter of Intent that commits them to develop a regional Low-Carbon Fuel Standard (LCFS) they describe as a market-based, technology-neutral policy (Dec 31). It requires reductions in the average lifecycle GHG emissions per unit of energy. Signatories from environment and energy agencies committed to a draft MOU on a regional program to be forwarded to the 11 governors by December 31, 2009.

Midwest Greenhouse Gas Regional Accord:

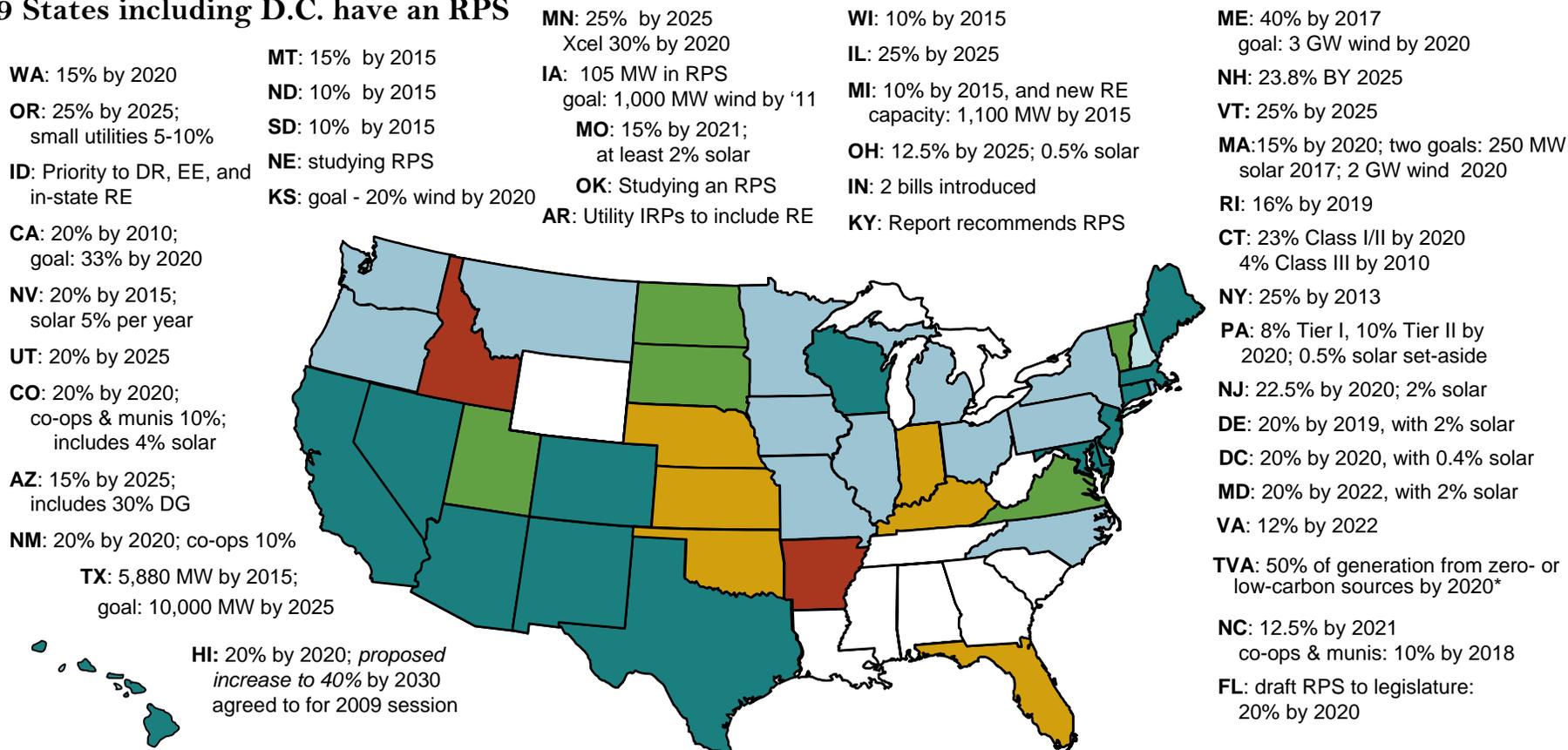
- Signed at Midwestern Governors Association Energy Summit to establish GHG reduction targets (Nov 2007).
 - Participants: IA, IL, KS, Manitoba, MI, MN, WI
 - Observers: IN, OH, Ontario, SD
- Preliminary Design Recommendations issued (Dec 2008)
 - Target reductions from 2005 levels:
 - 15% - 25% reductions by 2020
 - 60% - 80% reductions by 2050
 - Cap-and-trade should cover multiple sectors:
 - electric generation and imports (power plants)
 - Industrial combustion sources (factories)
 - Industrial processes, if measurable and verifiable
 - Transportation fuels, subject to modeling results
 - Each jurisdiction to control allowance distribution methods.
 - Final design pending results of further ICF modeling.
- MGGRA anticipates Model Rule by August 2009.

Western Climate Initiative (WCI):

- Launched by WGA to reduce regional GHG collectively and cooperatively (Feb 2007).
 - Partners: AZ, British Columbia, CA, Manitoba, MT, NM, Ontario, OR, Quebec, UT, WA
 - Observers: AK, CO, ID, KS, NV, Sask., WY
- WCI announced design for a market-based, *multi-sector* cap-and-trade program (Sept 2008):
 - 15% CO₂ reduction below 2005 levels by 2020
 - Covers 90% of regional emissions
 - Phase I to take effect Jan 2012
 - Phase II will begin 2015

Renewable Energy Portfolio Standards (RPS)

29 States including D.C. have an RPS

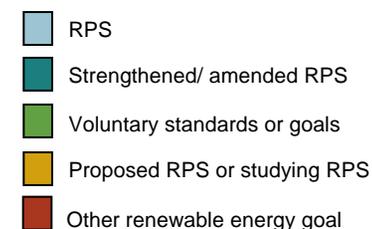


Updates at: <http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-rps.pdf>

Notes: An RPS requires a percent of an electric provider's energy sales (MWh) or installed capacity (MW) to come from renewable resources. Most specify sales (MWh). Map percents are final years' targets. Details, including timelines, are in the Database of State Incentives for Renewables and Energy Efficiency: <http://www.dsireusa.org>. Alaska has no RPS; TVA's goal is not a state policy: the Public Power Authority called for 50% of generation from zero- or low-carbon sources by 2020.

Abbreviations: DG: distributed generation; DR: demand response; EE: energy efficiency; IRP: integrated resource plan, RE: renewable energy.

Sources: Derived from data in: EEI, EIA, LBNL, PUCs, State legislative tracking services, DSIREUSA, Pew Center, and the Union of Concerned Scientists.



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Renewable Energy Portfolio Standards

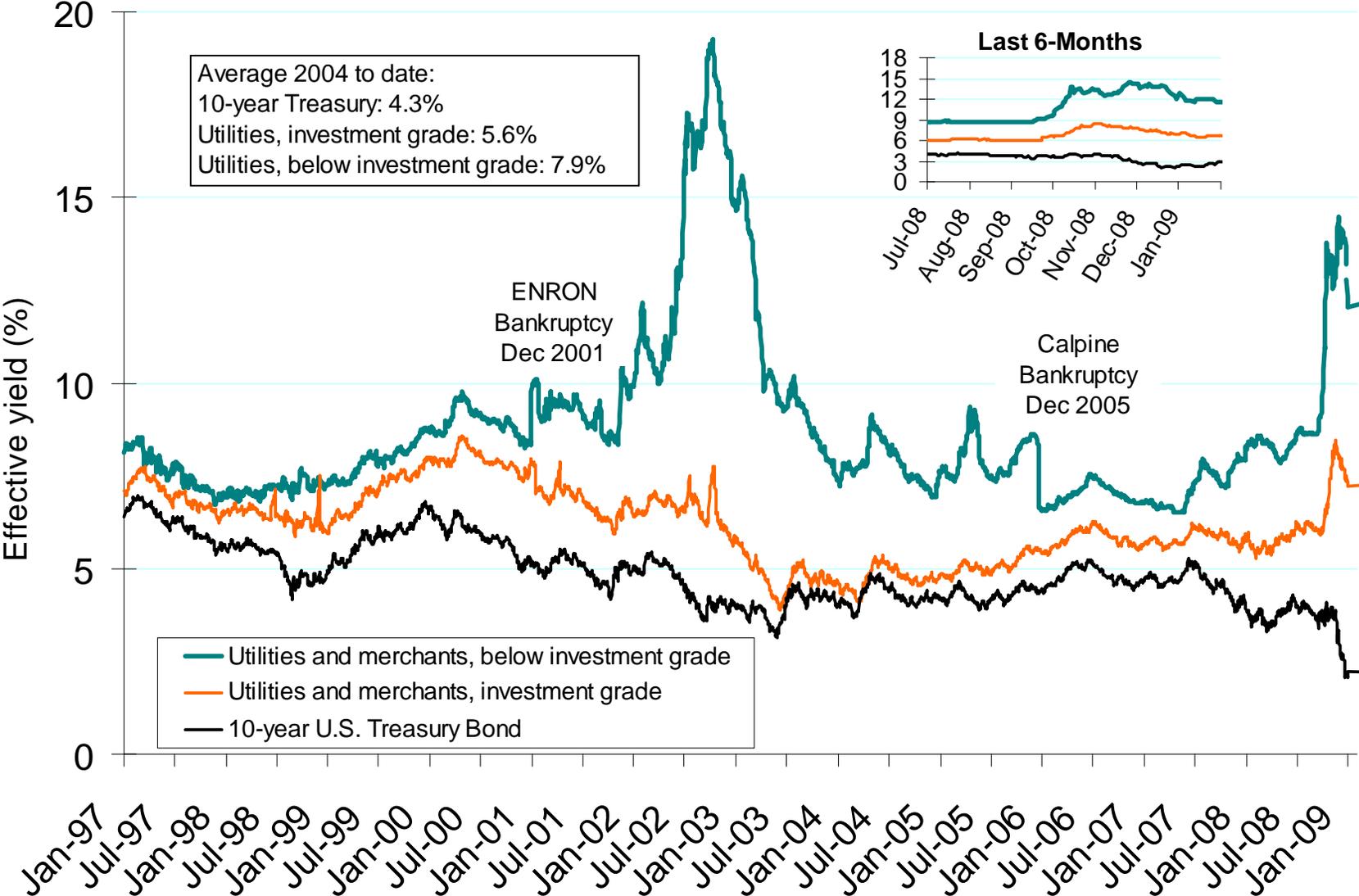
- **A Renewable Portfolio Standard (RPS)** requires a percent of energy sales (MWh) or installed capacity (MW) to come from renewable resources. Percents usually increase incrementally from a base year to an ultimate target. The percents on the map are ultimate targets.
- **29** states – including D.C. – have renewable mandates.
- **Six** have renewable goals without financial penalties: KS, ND, SD, UT, VT and VA.
- **Six** states proposed RPS bills or released studies that propose including more RE in state resources: FL, IN, KS (bills) and AK, KY, NE (state energy reports).
 - **Florida's PSC** sent its draft RPS to the legislature in response to an April 2008 legislative requirement. The legislature will decide how to proceed.
 - **Indiana's** House introduced two bills for an RPS in January. A traditional one has a 20% by 2020 target; the other creates two compliance tiers. An RPS bill did not pass last year.
 - **Kansas** introduced an RPS bill, with a 20% by 2020 target based on a utility's average peak load (in MW) for 2016-18. (Jan 14)
 - **Alaska** issued "Sustainable Energy for Alaskans" as a guide for communities to review local energy sources including in-river hydro, wind, solar, wave, tidal, biomass, and geothermal, in addition to traditional resources. It does not recommend state action or set a RE goal. (Jan 7)
 - **Nebraska's** "Interim 2009 Energy Plan" supports enacting an RPS and stresses EE, RE, and Nebraska's commitment to nuclear power. A final report will identify regulatory and statutory activities following the comment period, which closed Jan 23.

OVERVIEW OF 2008 RPS DEVELOPMENTS:

- **Three states passed a new RPS:** Ohio, Michigan, and Missouri. Ohio's and Michigan's were by state legislation; Missouri's was the third RPS to pass by ballot (after Colorado and Washington state).
- **Five jurisdictions amended or strengthened** existing standards: Washington, D.C.; Maryland; Massachusetts; Minnesota; and New Hampshire.
- **Four states** with an existing goal or RPS strengthened them: ME, VT, CA, HI. Maine enacted an installed wind goal. Vermont increased its goal to 25% RE by 2025. California's goal, set by Executive Order, is to increase RE to 33% by 2020. Hawaii set a goal of 40% of energy from renewable sources by 2030.
- **Four states** adopted a voluntary RPS or renewable goal: SD, UT, KS, and FL. South Dakota (Feb) and Utah (April) enacted goals without non-compliance penalties. An MOU between the Governor and Kansas utilities created its goal. Florida's goal, via Executive Order, is for utilities to produce 20% from RE; the PSC sent a draft RPS to the legislature on Jan 30.
- Kentucky and Oklahoma are working to establishing a renewable standard by legislation in 2009. In 2008, OK passed a bill allowing recovery of wind-related transmission costs.
- **Sixteen** states include energy efficiency in their RPS or renewable goals. Several issued major energy plans or draft plans with goals encompassing renewable energy, energy efficiency, and greenhouse gas reduction, including Kentucky, New Jersey, New York, and Vermont.

Abbreviations: EE: Energy Efficiency; MOU: Memorandum of Understanding; PSC: Public Service Commission; RE: renewable energy; RPS: Renewable Portfolio Standard

Yields of Utilities, Merchants and Ten Year Treasury Bonds



Source: Derived from Merrill Lynch Index U.S Corporates, Gas and Electric Utilities and Bloomberg data.
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